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Nature in Avon

2000 Volume 60

Bristol Naturalists' Society

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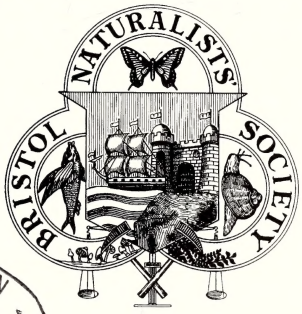
NATURE IN AVON

THE PROCEEDINGS OF THE
BRISTOL NATURALISTS' SOCIETY
Founded in 1862

VOLUME 60 (for 2000)

EDITED BY TERRY SMITH



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EDITORIAL

It was with great trepidation that I took on the post of Editor of *Nature in Avon*, a Journal with such a long and distinguished history. I trust that I can vindicate the trust that the Society has placed in me. All errors are my own, and for these I must apologise. Thanks are due in particular to my predecessor, Dr Roger Avery, for the production of the recent volumes that have set a high standard for *Nature in Avon.* I gratefully acknowledge the assistance of Richard Bland in compiling the Journal, and for his advice on editorial matters. I must give special thanks to Tony Smith for his generous help, and for his guidance in making the innovations in this issue.

Those who have written the Section Reports and the Biota have also made significant contributions, while without the scientific papers of high quality submitted by members of the Society and others, the name 'Journal' could hardly be justified. We give more emphasis to the scientific papers this time, and hope that potential contributors will consult the revised 'Instructions for Authors' on the inside back cover before submitting their work. Members are encouraged to contribute long or short articles and to write natural history notes on topical subjects.

On publication of this volume of *Nature in Avon*, the Council of your Society has decided that changes are needed that will make our Journal more attractive to the readership. With the progress in information technology and advances in printing processes, we must ensure that we are at the leading edge of the presentation of natural history in the Bristol area. We would also like to introduce more colour illustrations. The presence of colour photographs is now established on the cover, but these will also appear as separate plates within the text as costs permit.

In view of the long history of publication by the Society, we are reviewing a few items from earlier issues, making comparisons with current observations.

The Journal is the greatest expense in the budget, but it is also the public face of the Society and we must continue to review its presentation. We look forward to receiving comments from our readers.

Terry Smith
8 Friendship Road, Nailsea, Bristol, BS48 1AE
Tel 01275 85 4317; email t.a.smith@blueyonder.co.uk.

EARLY HISTORY

One hundred years ago

The Proceedings for 1900 were published in 1902. Eight general meetings were held, including talks on visits to Burma and Lapland. The Entomological Section had a meeting discussing 'The insect tenants of straw', the Geological Section discussed a rock exposure at Redland and a Triassic deposit at Emborough. The Physical and Chemical Section had meetings on the measurement of dissolved oxygen in water, and the Ornithological Section, having completed a list of the species of the area wound itself up.

The issue contained an article by J.W. White on Field Botany in 1901, in which he sought to bring the twenty-year-old 'Flora of the Bristol Coalfield' up to date. He believed that the second edition would be somewhat deferred; it was actually published in 1912 to great acclaim. Among other species, he noted that *Fritillaria meleagris* Snake's-head Fritillary was not extinct as had been feared but known from three sites. He also mentioned that he had found *Scilla autumnalis* Autumn Squill, at the site on the Downs to which it had been 'translocated', to use the modern term, from the site of the Suspension Bridge in 1830.

An article on 'The bone caves of Uphill' by the late E. Wilson describes the opening of a cave in a quarry and the recovery of bones. It seemed as if the bones had been washed into the cave. They consisted of masses of Hyena, Horse, Cave Bear, Woolly Rhinoceros, and Mammoth bones. Also found were Rabbit, Sheep, Mole and Fowl but there was no way of dating these. There was also the skull of a Badger, which he noted was extinct in the district, the last specimen having been killed twelve years previously.

Fifty years ago

The Proceedings for 1950 were issued on July 5th, 1951. The Society had 450 members, presided over by H.H. Davis, and the total annual income was £690.

The Botanical section was very active and included a walk to the Arboretum at Blaise, which contained 77 tree species. The Entomological Section had a talk by J.V. Pearman on 'Book lice and their kin', and the Geologists heard about "James Hutton and the birth of geology". Attendance at the Ornithological Section meetings averaged 135, partly due to the attraction of film shows. The fieldwork committee organised a census of the rookeries of the city of Bristol, including one in Queens Square.

There were notes on the many species of earthworms of the Bristol District, the Cirl Bunting nested as usual on Durdham Down, Redstart bred at Clifton High School, a Corncrake was heard all summer at Tickenham and the Marsh Fritillary butterfly was common at Wickwar. Fierce storms in February and September drove Little Auk, Gannet, Kittiwake and Manx Shearwater inland.

Compiled by Richard Bland

From *The Bird* by Jules Michelet (1870) London, T. Nelson and Sons, by kind permission of Philip New.

On the origin of words associated with the oak tree

'From *quer* fine and *cuez* a tree, *Celtic* according to Lepelletier: but according to others from the Greek word *choiros*, a pig; because pigs feed on the acorns. The Celtic name for this tree (Derw) is said to be the root of the word Druid (that is, priest of the oak, and of the Greek name Drus. The Hebrew name for the oak (Al or Alon) is said to be the origin of the old English word *llan* (originally signifying an oak grove, or place of worship of the druids, and afterwards by implication a town or parish) and also of the Irish words *clan* and *clun*. In the book of Isaiah xliv.14., idols are said to be made of Allun or Alon; that is oak (Lowth's Trans).'

J.C. Loudon, (1843) in *Arboretum et Fruticum Brittanicum* p. 846

Proceeding of the Bristol Naturalists' Society (2000) ***60****:5-10*

THE RETURN OF THE OTTER TO AVON

Alison Washbrook
North Somerset Levels and Moors Biodiversity Officer

Trained volunteers of the North Somerset Otter Group have found signs of activity across the area. The otters' return is being helped by habitat creation schemes of the North Somerset Levels and Moors Project.

The levels and moors

Hundreds of years ago, the Avon Levels and Moors were a large inter-tidal salt marsh with occasional low hills rising from their watery vestige. When Romans settled on the higher ground they built the first sea defences and dug ditches, known today as rhynes, to drain the marsh and create conditions more suitable for agriculture. Since then, the landscape has become progressively drained by a network of rhynes, whilst sea defences have maintained freshwater grazing marsh.

Today, the Levels and Moors cover an area of about 40 square miles of North Somerset and are characterised by an open landscape with a network of rhynes, wetland vegetation and cider orchards. They offer high quality grazing pastures, home to a rich variety of wildlife.

The rhynes provide a refuge for many plants and animals, including nationally scarce species such as *Hydrocharis morsus-ranae* Frogbit and *Brachytron pratense* Hairy Dragonfly. Traditional farming practices have maintained this unique and valuable wildlife interest by removing vegetation from rhynes in rotation, creating a mosaic of different successional stages of vegetation that can support a diversity of plants, invertebrates, fish and birds. Otters are also a natural part of this ecosystem, and their fates are strongly influenced by our use of the landscape.

The North Somerset Levels and Moors Project was established in 1995 to promote the sympathetic management of grasslands, rhynes and hedgerows that cross this historic landscape. These aims are currently being achieved through the implementation of actions in North Somerset Council's Biodiversity Action Plans (BAPs) and the Local Environment Agency Plan (LEAP).

Otters

Lutra lutra the Eurasian or European Otter is native to Britain and parts of Western Europe and Asia. It is a member of the Mustelidae, which includes weasels, stoats, badgers, polecats and mink. Otters are large carnivores, weighing up to 17kg and up to 120cm long, and they will eat on average 1kg of food per day. Their diet comprises 95% fish, with eels being their favourite, as

well as roach, perch, salmon and trout. They will also eat birds, amphibians, molluscs, crustaceans and small mammals. Diet may be seasonal with amphibians often being a major part in the spring.

As otters are nocturnal they rest during the day in undisturbed areas. They have large territories covering up to 40km of a river, although when food and shelter are abundant, territories can be much smaller. Thus, they may have up to 30 resting places known as holts to use, often in the root system cavities of bank side trees, but also in dense scrub, culverts and reed beds.

Although otters can tolerate some disturbance, using watercourses near towns or that have well-used public footpaths alongside, they will require an undisturbed place in which to breed, which can happen at any time of the year.

Having large territories and also being solitary requires constant vigilance and territorial marking. This is to our advantage. Otters leave their droppings, known as spraints, in strategic places along riverbanks and ditches to act as signs to other otters, saying "Keep off" or "I am looking for a mate." To us the spraints say "An otter has been here". Like many mammals, otters are creatures of habit, regularly sprainting in the same place - maybe under a bridge where the droppings are not washed away by rain, or on a rock at the water's edge where the scent will drift across the water and be easily picked up by other otters. It is the scent that is the most distinctive feature for us.

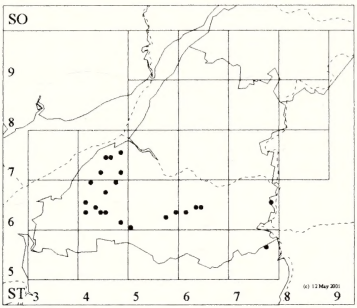
Spraints are sweet smelling - some say they smell like roses, - others say jasmine tea or hay. Whatever, a fresh spraint smells like no other dropping! During training sessions I have asked volunteers to smell a spraint. "It's not that nice!" is often the retort! But, when compared with the unmistakably unpleasant stench of a mink scat, the otter spraint is actually not too bad. If you can sniff it more than once it may well be an otter spraint!

Another sign that surveyors can look for is footprints. Like all mustelids, otters have five toes, but they also have small webs between the toes to aid swimming. Their feet are large, about 6-7cm across the toes, and the toes are clearly in a semi-circle; unlike badgers that have forward facing toes. However, footprints can be hard to distinguish even for experts, and are not always a reliable sign. (Otter footprints are illustrated in the colour plates).

Otters in Avon

Like most of lowland England, Avon lost its otters in the 1960s during times of heavy pollution of watercourses, especially from farm pesticides, and habitat loss. There are reports of otters being shot in the 1950s and 1960s on the

Congresbury Yeo and Blagdon Lake, but since then, there have been few signs until recently. Surveys in the 1990s had shown that there was some otter activity on the Congresbury Yeo, but not much elsewhere in North Somerset.



Distribution of the records of otters (spraints, footprints and sightings) for the region from 1st January 2000. (plotted by Nigel Milbourne on MapMate ; copyright Mark Yeates 1998-2001, Teknica Ltd)

Then, in late December 1999, a dead female otter was picked up from a bridge over the Congresbury Yeo. She had been killed by a vehicle as she crossed a bridge at night during high river levels, a common cause of death for otters across Britain. Post mortem results showed that she was a healthy adult female that had bred and that she had been eating frogs. At the time, it was feared that she might have been our only otter, as the only signs found in North Somerset beforehand had been on this stretch of the Yeo. However, fresh signs of otter activity were found over Christmas in the same area, showing that there was another otter nearby.

In March 2000 the North Somerset Otter Group (NoSOG) was formed as part of the North Somerset Levels and Moors Project to survey and monitor our local otter population. Volunteers carry out surveys four times a year on a chosen stretch of watercourse and cover over 60km of rivers, streams and rhynes in North Somerset. Meanwhile, the Bristol Avon Otter Group, set-up in May 2000 makes monthly surveys on the River Avon and its tributaries, from Bristol through Bath and into Wiltshire. The results of the volunteer surveyors have been outstanding, with signs of otter activity found across much of North Somerset and along the River Avon.

Some of these sites have not had records for over 30 years and the knowledge

that the water quality of our rivers and rhynes in Avon is now good enough to support these elusive animals is very exciting. The return of otters to Avon is something to be celebrated.

The North Somerset Levels and Moors Project works with farmers, landowners and managers to promote 'otter-friendly' management of wetlands and rivers. Such work includes managing rhynes to promote biodiversity or planting small clusters of trees and shrubs along otherwise featureless riverbanks, and installing otter holts in areas where there is little other cover. Trees and holts provide resting areas for the otters to use during the day, but can also benefit other wildlife. Tree shade cast on the rivers suppresses excessive waterweed growth, whilst helping to regulate water temperature during the summer months. In heavily shaded stretches of rivers, suitable management can include opening up the tree canopy over the water to let in more light to encourage aquatic plants and invertebrates to flourish. Wood from pollarded trees can then be used to build log pile otter holts. Ideally, rivers should have dappled light over them with about 50% shade and 50% light on the water. This creates conditions in which aquatic ecosystems can flourish, with otters as the top predators. Conversely, rhynes are usually open with little shade.

From the painting by Bruce Pearson, reproduced with kind permission from 'The Otter Among Us' by James Willliams (Tiercel Publishing, 2000) ISBN 0 9532002 2 1; price £26.

Flowering plants are plentiful in the rhynes, whilst rare invertebrates, such as the Great Silver Diving Beetle, swim in open water. Good management of rhynes can include removing scrub, pollarding willows that cast shade on the water, re-profiling the banks to create shallow edges suitable for marginal plants, such as Yellow Flag Iris, or creating steeper banks suitable for water vole burrows. This work benefits the other flora and fauna in these habitats. As top predators, otters require a healthy ecosystem to support their main food source, fish.

Reproduced from '*Otters and River Habitat Management*' with kind permission of The Environment Agency and the artist, Gabrielle Bordewich

Research into identifying individuals by DNA analysis of fresh spraints has been piloted in some parts of England and may become a useful tool for counting the numbers of otters in North Somerset and to track their movement across our landscape. The Otter Groups have worked hard to establish the fact that otters are back, but it is vital that we maintain monitoring over the long-term so that threats to the population can be identified, and where possible remedied.

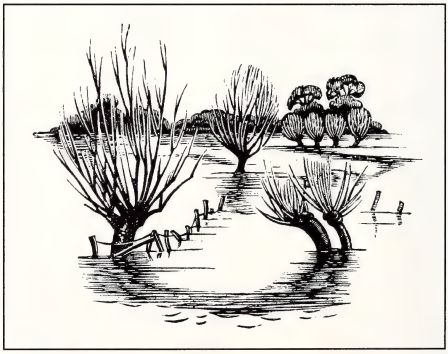
Alison Washbrook
North Somerset Levels and Moors Biodiversity Officer
Avon Wildlife Trust, 32 Jacobs Wells Road, Bristol BS8 1DR
Tel. 0117 9177278: email: alisonwashbrook@avonwildlifetrust.org.uk

The author is the North Somerset Levels and Moors Biodiversity Officer. The North Somerset Levels and Moors Project is a partnership between Avon Wildlife Trust, North Somerset Council, the Environment Agency, English Nature and the Bristol Regional Environmental Records Centre. The Project also works closely with the National Otters and Rivers Project.

Anyone interested in taking part in otter surveys should contact the author at the address above, or Simon Reece (Bristol Avon Otter Group) School House, Clifton College, Bristol BS8 3HY Tel. 0117 3157 300. email: sreece@clifton-college.avonsch.uk

Further reading

Environment Agency (1999). *Otters and River Habitat Management* (2nd Ed.).
The Wildlife Trusts (1998) *Splash Back: the return of the otter.*
Williams, J. (2000). *The Otter Among Us.* Tiercel Publishing.
Sargent, G. and Morris, P. (1997). *How to Find and Identify Mammals.* London: The Mammal Society



The picture above is from *'Sweet Thames Run Softly'* by Robert Gibbings, (1941), reproduced by kind permission of Reading University Library.

Proceeding of the Bristol Naturalists' Society (2000) ***60****:11-29*

BRISTOL MAMMAL REPORT 2000

Compiled by Mary J. Trump and David P. C. Trump
Co-leaders of the Mammal Group, BNS

Details of all local wild mammal records, with notes on national and local surveys and special reports.

Introduction

This is the eleventh recent mammal report for Bristol and its surrounding districts. Its intention is to be a wide-ranging review of the records and studies of mammals in and around the Bristol area and to report on significant issues and events affecting British mammals in 2000. The number of one-kilometre squares in which those species were recorded in 2000 is given in brackets after the scientific name, followed by the number of one kilometre squares for 1999. The former county of Avon covered an area of approximately 1300 square kilometres, and so the number of 1 km squares for which records have been received gives an indication of the abundance of each species. All grid references are for the 100 km grid square ST. Where no figures appear after the species name, no specific records were received (however, there may have been records of that species from another source). The differences between the years may be due to changes in numbers and locations of recorders rather than changes in mammal abundance or distribution. The highlight of the mammal year was undoubtedly the continuing spread of Otters into the area from Somerset. (See also the article on page 5 by Alison Washbrook in this issue.)
This year data from the British Breeding Bird Survey has been incorporated into the report. This has increased dramatically the number of records for a range of species. The type of record (e.g. dead on road, foot prints etc.) is not generally specified.

Our thanks to all those who provided records and information for this years report:
Richard Bland (RLB), Fiona Bowles (FB), Andrew Bradbury (AB), John F Burton (JFB), Paul Chadwick (PJC), Bob Cropper (RSC), Langdon Davis (LD), Paul and Beth Fletcher (P & BF), Sam Hallett (SH), Vicky Hill (VH), Royston Hoddinnot (RH), Gareth Jones, Tessa Kilburn and John Knight (TK & JK), Dennis Marsh (DM), Joan Marsh (JMM), David Paine (DP), Sarah Phipps (SP), Jo Quintrell (JQ), JC Rawlinson (JCR), Simon Reece (SR), Roger Symes (RGS), David Trump (DT), Eric Trump (ET), Mary Trump (MT), John Tully (for all the Breeding Bird Survey mammal data), David Warden (DW).

The Breeding Bird Survey.

The Breeding Bird Survey (BBS) sponsored by the British Trust for Ornithology (BTO), Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservation Committee (JNCC) asks all surveyors to record sightings or signs of mammals during their April to June surveys. The results of the 2000 survey (kindly summarised by John Tully) have been incorporated into this report and certainly add a great deal to our knowledge of the distribution of mammals in the Bristol area.

In 1999 some 85% of all BBS fieldworkers nationally carried out a mammal survey (Noble *et al.,* 2000). In total, 40 species of mammal were recorded, and the top 15 were:-

Species	No of 1-km squares	% of squares
Rabbit	1429	71
Grey Squirrel	721	36
Red fox	685	34
Brown hare	680	34
Mole	508	25
Roe Deer	399	20
Badger	278	14
Hedgehog	247	12
Common Shrew	177	9
Stoat	168	8
Brown Rat	160	8
Weasel	135	7
Muntjac Deer	109	5
Red deer	97	5
Fallow deer	85	4

There are proposals to set up a co-ordinated mammal monitoring network for the UK, similar to the bird surveys organised by the BTO and its partners. Mammal monitoring is one of the requirements of the UK Biodiversity Action Plan, the Convention for Biological Diversity and the European Habitats Directive. The BBS mammal survey is likely to be used as one of the methods of surveying for visually-detected mammals and monitoring changes in their distribution.

Reports on mammals

Insectivora (hedgehogs, shrews, and moles)

Erinaceus europaeus **Hedgehog** (97 1-km squares , 52 for 1999)
There were road casualty records from 79 1-km squares. [RLB, PJC, TK & JK, DM, JMM, DP, JCR, DT, ET, DW.]

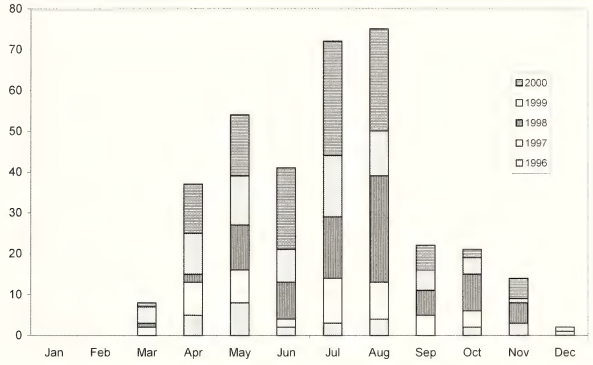


Figure 1. Number of Hedgehog Road Casualty Records per Month 1996-2000

Five years' data and 346 records of road casualty Hedgehogs show two main peaks (Figure 1): In May, when most Hedgehogs have emerged from hibernation, and in July/August when the young of the year disperse. Hedgehog road casualties have now been recorded in every month of the year except January and February.
Other Hedgehog records/sightings/observations :-
Clevedon (4171). Young Hedgehog found skinned on lawn possibly killed by a badger, 28 October (RGS).
Ashton Hill Golf Course (5370). One seen on 28 June (TK & JK).
Pilning (5585). Regular observations of 1-2 Hedgehogs in garden from 14 March to 6 November (JCR).
Bishop Sutton (5859). One seen in garden during year, fewer than normal killed on road in village (DW).
Westbury-on-Trym (5879). One seen crossing road at 23.30 hrs 4 May (RGS).
A37 Pensford (6163). One seen on 11 August (TK & JK).

Thornbury (6489). Regular sightings of up to 2 in garden May to August (DP). Tormarton (7678). One seen crossing road at 20.20 hrs on 23 July (JCR).

The Hedgehog and its ancestors have been pottering around for at least 20 million years, but how much longer does it have? Pat Morris of the University of London reports that there is bad and good news for the Hedgehog in the 21st century ('Look sharp' *BBC Wildlife* 18(5) May 2000). Road traffic may account for up to 100,000 Hedgehog deaths per year; the garden strimmer countless others. Modern farms with fewer hedges and new housing estates with smaller gardens provide little in the way of suitable habitats to encourage hedgehogs. Badgers will eat Hedgehogs and studies at the University of Oxford suggest that Badgers, whose population increased by 70% between 1985 and 1995, may already be threatening the survival of Hedgehogs in many areas. This could be either through competition for food – a Badger can eat the same amount of earthworms as five Hedgehogs, or through direct predation. Further bad news comes in the form of the widespread use of methiocarb for agricultural slug control that may be both directly and indirectly toxic to Hedgehogs. Good news comes in the form of a network of wildlife rehabilitation centres throughout the country and the success of rehabilitated Hedgehogs released back into the wild, which has been established by radio-tracking released Hedgehogs. Further good news is that metaldehyde, used in garden slug pellets, is not a cumulative poison and rapidly decomposes to harmless residues in dead slugs, which means that eating poisoned slugs in gardens may not kill Hedgehogs.

The Breeding Bird Survey produced records from 10 1-km squares

Talpa europea **Mole** (151,78)
Records from 136 1-km squares All the records were of molehills, generally the only visible signs of the presence of these secretive mammals. [RLB, PJC, TK & JK, JCR, DT and MT.]

A count of discrete 'groups' of molehills in permanent pasture/agriculturally improved grassland in West End, Nailsea (4469) on 19 February produced a total of 34 groups suggesting that there were at least 34 individual Mole territories in this 1 km square. The Breeding Bird Survey produced records from 16 1-km squares.

The Minister of Agriculture confirmed (*Hansard Written Answers*, 10 May) that permits continue to be issued to allow use of strychnine hydrochloride for Mole eradication.

Sorex araneus **Common Shrew** (1,3)
Only four records this year, all from Pilning (5585). Unfortunately all records were of animals that were found drowned in a pool in scrub/grassland between June and August (JCR).

Neomys fodiens **Water Shrew** (0,2)
No records for the year. A study by Sara Churchfield of King's College, London has shown that the Water Shrew is not as rare as previously thought. She studied the habitats in the river catchments of the Arun, Adur, Rother, Ouse, Mole and Medway in southern England and found that 42% of the sites were occupied by Water Shrews (Wildlife Reports, *British Wildlife*, 11(5) June 2000).

Chiroptera (Bats)

Rhinolophus ferrumequinum **Greater Horseshoe Bat** (1,8)
A male ringed at Mells in November 1987 was found in a small cave in East Harptree Combe (5655) on 16 April, and in a different cave nearby on 5 November (RSC).

Rhinolophus hipposideros **Lesser Horseshoe Bat** (3,15)
Records were received of 35 at Compton Martin ochre mine on 2 January (RSC), 16 in a cave at East Harptree Combe (5655) on 5 November and one in a small cave nearby (RSC). A further un-confirmed record of two bats in a barn at Coombe Hay, Bath (7360) on 6 March - one found dead and one flew off (FB).

Myotis daubentoni **Daubenton's Bat** (0,2)
No 'Avon' records this year. Research by Jens Rydell on Daubenton's bats has shown that they concentrate their foraging activity over calm surfaces of water. Ripples produce ultrasonic noises that interfere with the bats' ultrasonic target detection. It has also been found that this affects Pipistrelles similarly, thus showing the importance of enhancing riverbank vegetation and maintaining 'quieter' patches of water (Wildlife Reports, *British Wildlife*, 11(4) April 2000).

Nyctalus noctula **Noctule** (1,0)
No 'Avon' records this year. However at least one seen flying with Swifts at Axbridge (4254) in August (P & BF).

Plecotus auritus **Brown Long-eared Bat** (0,0) No 'Avon' records this year.

Myotis nattereri **Natterer's Bat** (1,3)
Bat detector records from River Chew at Pensford (6163) on 12 August (TK & JK).

Pipistrellus pipistrellus **Common Pipistrelle** and *Pipistrellus pygmaeus* **Soprano Pipistrelle** (3,2)
Bat detector record from Pensford Church Yard (6163) on 12 August (TK & JK). Single bat in bat box at Chew Valley (5760) on 11 June (DT, MT, RH). Up to two bats seen in flight June to July over a garden at Pilning (5585) (JCR).

Myotis mystacinus **Whiskered Bat** (0,1) No 'Avon' records this year.

Bat studies at Bristol University

The current population of *Rhinolophus ferrumequinum* Greater Horseshoe Bat in South West England and South Wales is highly fragmented with the loss and isolation of many maternity colonies. Currently there are about 20 known maternity colonies and a British population of between 4,000 and 6,600 bats. Comparisons between the genetic structure of these bats, and colonies in France and Italy, show that the Welsh and English colonies are genetically isolated (Rossiter *et al.*, 2000). This and the smaller genetic variability between British bats compared with those from northern France may be a result of genetic drift or the species colonisation history. Small fragmented populations are prone to inbreeding and loss of genetic variability and all the potential problems this can cause. Gene flow between most neighbouring colonies was not generally restricted, with one or two notable exceptions (e.g. at Woodchester Park in Gloucestershire). Female Greater Horseshoe Bats return annually to their natal roosts to give birth and raise single young, while males are more dispersed throughout the year. In the autumn, females visit males in breeding territories to mate, with both sexes hibernating in caves, disused mines or cellars mostly near their natal roosts. Breeding females rarely change colonies and inter-colony gene flow probably occurs mainly via extra-colony mating in the autumn when the females may visit males in different colonies. This is limited by both the distance of dispersal during this period and the availability of suitable mating sites. The authors suggest that to improve range connectivity, and so facilitate genetic exchange among colonies, management should include the identification and protection of male territories and their surrounding habitats.

Lagomorpha (Rabbits and Hares)

Lepus europaeus **Brown Hare** (34,18)
Records from the following 1 km squares:- A46 (7784) one seen on 21 February and one on 7 May; Stowey (5959) two seen in fields on 16 March; Cheddar Reservoir (4353) one seen on 16 March; Walborough – salt marsh (3157) four seen on 17 March; Middledown Lane (7472) 3 seen on 9 April; Middledown Lane (7474) 3 seen on 30 April, 1 dead on road; West Littleton (7574) 2 in pea

crop on 21 May; Marle Hills (6583) two seen on 31 May; Folly Farm (6060) two seen on 2 June; Marshfield (7774) one walking along road on 8 June; Dolebury Warren (4558) one seen on 22 July; Leigh Court (5474) five seen feeding in field on 5 August; Downthorns Farm (7975) adult with leveret on 21 August; A370 at Cambridge Batch (5269) one run over on 12 November. [RLB, AB, PJC, P & BF, RSC, DT, DW.] The Breeding Bird Survey produced records from 22 1-km squares

The National Hare survey (1997-99) showed that Brown Hare populations across large areas of lowland Britain are continuing to decline. A survey in the early 1990s produced a population baseline of c.817,000 Hares compared with c.752,000 today. The UK Biodiversity Steering Group Report has committed the Government to doubling spring Hare numbers by 2010, but the introduction of farmland environmental improvement schemes such as Environmentally Sensitive Areas, Countryside Stewardship, Nitrate Sensitive Areas and the expansion of set-aside appears to have so far failed to reverse the Hare's fortunes. Britain is the only EC country that doesn't have a 'close season' for Hare killing or a restriction on the numbers killed either by shooting or coursing with dogs. Survey organiser Professor Stephen Harris of Bristol University has suggested that there should be a 'close season' for Hares on welfare and conservation grounds, a call resisted by British field-sports groups. This poses an interesting challenge for the Government. (*BBC Wildlife* 18(4) April 2000)

Oryctolagus cuniculus **Rabbit** (105,30)
Records from 57 1-km squares, and evidence of myxomatosis was found in 3 squares. A black Rabbit was observed amongst normal coloured Rabbits at Fry's Hill (4355) by P & BF on 27 February. [RLB, PJC, P & BF, JCR, DP, DT and MT.]
The Breeding Bird Survey produced records from 49 1-km squares

Rodentia (rats, mice, voles and squirrels)

Rattus norvegicus **Brown Rat** (17,11)
Records from 9 1-km squares. Rats were seen in one of the car parks at Cribbs Causeway shopping centre (5881) in July, November and December. [RLB, PJC, P & BF, JCR, DT, MT.] The Breeding Bird Survey produced records from 7 1-km squares.
Sciurus carolinensis **Grey Squirrel** (77,42)
There were records from 45 1-km squares. [RLB, JFB, PJC, P & BF, DP, JCR, DT.]
As part of his standard weekly bird-recording walk (2 km within Clifton 5673) Richard Bland has been counting Grey Squirrels. The count for 2000 was 77 at a

rate of 1.71/hour. This compares with counts of 58 at a rate of 1.29/hour in 1998 and 78 at a rate of 1.71/hour in 1999.
Up to six Grey Squirrels observed in a garden in Sheepwood, Westbury-on-Trym (5778) in May (JFB). Squirrels were observed regularly in a garden in Pilning (5585) where they live in an ivy- covered ash tree. A single Grey Squirrel was seen on 7 January, two on 7 April, three youngsters on 26 May, two adults with three youngsters on 18 June, one to two seen regularly in August and September, and two seen on 10 October, the last sighting of the year (JCR).

Up to 12 individuals seen in Brandon Hill Park (5772) on 30 April. One observed to fall c.10 metres out of a tree onto a tarmac path. It appeared to be momentarily stunned, but quickly recovered, scampered to the nearest tree and ascended at great speed, appearing none the worse for its fall (JCR). The Breeding Bird Survey produced records in 35 1-km squares.

Arvicola terrestris **Water Vole** (2,0)
A record from Avonmouth (5379) on 4 May RLB. Latrines and runways next to a pool at Monks Pool Nature Reserve, Winterbourne (6381) on 23 Jan (AB).
A study by Steve Carter of Royal Holloway College, University of London suggests that reed beds provide a very important habitat for Water Voles as it gives some shelter from predators such as Mink. Population densities were found to be high and the Water Voles remained in the reed beds throughout the winter (Wildlife Reports, *British Wildlife*, 11(5) June 2000). The Water Vole population has declined by 90% over the last 15 years so a release programme has begun in Oxfordshire. Two sites have been chosen for this three-year study and reed beds have been renovated and ditches made where necessary across arable land. Captive bred animals are being used that will be tagged and monitored for two years. Mink control will also take place, as they are the Water Vole's main threat (Wildlife Reports, *British Wildlife*, 12(1) October 2000).

Clethrionomys glareolus **Bank Vole** (4,1)
Records from West End, Nailsea (4569), one seen under bird feeder; and the Grove School, Nailsea (4669), one captured in a Longworth live-capture trap. [DT, MT.] Also from 3255 and 7581 (Breeding Bird Survey).

Microtus agrestis **Short-tailed Field Vole** (2,2)
Recorded only from Pilning (5585) - seen frequently in garden in June and July (JCR), and Ashton Hill Golf Course (5370) (TK & JK).

Micromys minutus **Harvest Mouse** No records for the year. (But see colour plate)

Muscardinus avellanarius **Common Dormouse**
Dave Clarke's Dormouse box studies in King's Wood, Cleeve continue. His is one of 130 sites nationally with over 7,000 nest boxes being checked by some 600 volunteers each year and over 1,500 dormice being recorded (*Endangered British Mammals Fund Newsletter* No.7 Autumn 2000).
There have been a number of occasional records from beyond the King's Wood complex that would indicate that the population is more extensive. During 2000 it became apparent that Dormice are present in the Brockley Combe/Lulsgate, Cleeve Woods and Barrow Gurney areas.
Brockley Combe/Lulsgate: At least 12 hazelnuts showing signs of being eaten by Dormice were found on 21 December amidst dense scrub at Potters Hill (5066). Five of these nuts were of the 2000 crop. Experienced naturalists in the area found similar signs in the same area during the late 1990s.
Cleeve Woods: A male Dormouse was recorded in a nest box in the Goblin Combe nature reserve (4765) in August. A landowner at Cleeve Hill (4666) reported two Dormice in a Grey Squirrel drey. Unfortunately these were found dead after the drey had been fired at by a shotgun as part of a Grey Squirrel control programme.
Barrow Gurney: Twenty three hazelnuts eaten by Dormice were recorded in scrub at Barrow Gurney (5266) on 26 December. Ten of these nuts were from the 2000 crop. This site is an abandoned green lane and is part of an extensive hedgerow network.
Mendip: Evidence compiled during 2000 has indicated the presence of a Dormouse population in the Litton Reservoirs areas on the Bath and North East Somerset/Somerset border. Although this is not typical Dormouse habitat there is a network of small woodlands linked by hedgerows.
All Dormouse records were supplied by Phil Quinn, Avon Wildlife Trust.

Apodemus sylvaticus **Wood Mouse** (Long-tailed Field Mouse) (6,2)
Records from the Grove School Nailsea (4669) (one captured in a Longworth live-capture trap), (5373) nest built into an old song thrush nest, (4171, 5382 and 5585). Records from: PJC, JCR, RGS, DT. Also from 7581 (Breeding Birds Survey).
The Wood Mouse was found to be the most frequently recorded species in The Mammal Society's national survey of small mammals on grassland verges (Wildlife Reports, *British Wildlife*, 11(4) April 2000). A study by David MacDonald of the Wildlife Conservation and Research Unit (WildCRU), University of Oxford, has illustrated the effects of different crops on the numbers and movements of Wood Mice. Rape fields had significantly smaller numbers of mice than winter barley or wheat. Populations were greatest when the crops were at their tallest between April and July. Males were shown to move more quickly than females during most of the year. Wood Mice moved

more quickly around the field edge when it was bordered by a hedgerow. (Wildlife Reports, *British Wildlife*, 11(6) August 2000).

Mus domesticus **House Mouse** (3,1)
Records from 3 1- km squares [JCR].

Apodemus flavicollis **Yellow-Necked Mouse** (0,1)
No records for the year. A study by Aidan Marsh and Stephen Harris of Bristol University looked into the behaviour of the Yellow-necked Mice and the fact that they use houses to live in. Volunteers were asked to record all the small mammals in their houses. It was found that Yellow-necked Mice are predominantly a rural, woodland species. However, they regularly visit people's homes. It is thought that they do this as part of their normal behaviour in the autumn when dispersing animals are investigating new habitats. The study suggests that this species is more adaptable to new environments than previously thought (Living with Yellow-Necked Mice, *British Wildlife*, 11(3) February 2000).

National Road Verge Small Mammal Survey
Road verges cover an estimated 2100 square km in the UK and constitute an increasingly valuable wildlife habitat. Lincoln Garland of Bristol University reports on the initial results of the survey (*Mammal News* 121 7 and 123 8). During the autumn of 1999 143 grassy road verges were surveyed throughout the UK. Six rodent species (Bank Vole, Short-tailed Field Vole, Wood Mouse, Harvest Mouse, Yellow-necked Mouse and House Mouse) and three insectivores (Common, Pygmy and Water Shrew) and one mustelid (Weasel) were captured during the survey. By far the most frequently captured mammal was the Wood Mouse. Wood Mice were shown to prefer dense grassy cover and adjacent arable land, Bank Voles preferred dense grassy cover with increasing herb diversity and Short-tailed Field Voles grassland with increasing herb diversity and adjacent pasture. Common Shrews showed no significant habitat preferences. The survey continues until Spring 2001.

The English House Condition Survey
The survey, undertaken for MAFF as part of the Department of the Environment, Transport and the Regions showed that overall 1.8% (3.9%) of properties were infested by mice (House Mice?), 0.4% (0.9%) were infested inside by Brown Rats and 1.7% (4.8%) were infested outside by Brown Rats. Mice infestations inside and Rat infestations outside were more common in rural areas than in urban or suburban areas. Rat infestations inside were more common in urban, rather than in rural or suburban areas (*MAFF News Release* 2/00). [The figures in brackets are for a survey undertaken in 1993 but the

figures cannot be compared directly due to different sampling methods.]

Cetacea (whales, dolphins and porpoises) and Pinnatipedia (seals)

Halichoerus grypus **Grey Seal** (0,2)
No records this year. The Convention on International Trade in Endangered Species (CITES) Conference in Nairobi rejected an attempt by Norway and Japan to allow trade in whale meat and other whale products. (*MAFF News Release* 136/00).

Carnivora (carnivores)

Mustela vison **American Mink** (3,3)
One reported by a member of the public to the City Museum, swimming in a stream by a drainage lake at British Aerospace Filton (6080) on 5 March (SH). One seen on the bank of Bradley Brook, Winterbourne (6480) on 11 March (AB). A record of one individual at 6568 (Breeding Bird Survey).

A recent report by the Vincent Wildlife Trust has identified a dramatic decline in Britain's Mink population over the last seven years. The latest research shows a 91% drop in the number of sites occupied by Mink in Wales. Even in the Thames region, which has seen the smallest declines, Mink have disappeared from 27% of sites. The reasons for this are unclear but the Mink's rapid decline has roughly coincided with the rise of the Otter, which has been making rapid inroads back into its former range. Otters will kill and eat Mink and they will destroy the sites used by Mink to mark their territories. Whether the decline of the Mink will be in time to save the Water Vole is yet to be seen (*BBC Wildlife* 18(7) July 2000).

Mustela ermina **Stoat** (10,7)
Records from 2 1-km squares (RGS, MT), and the Breeding Bird Survey from 8 squares.

Mustela nivalis **Weasel** (10,3)
Records from 2 1-km squares (RLB, JCR), and the Breeding Bird Survey from 8 squares.

Mustela putorius **European Polecat** (2,1?)
Records from Severn Beach/Pilning (5485) of an individual crossing a road on 10 July (JCR) and M5 southbound Cambridge (7502) (just inside the Gloucestershire boundary) 30 January (DT).
Secondary poisoning of wildlife such as Polecats by rat poison, particularly the

more toxic second generation anti-coagulant rodenticides, have been found to cause more of an impact on wildlife than was originally thought. A recent study of polecats found rodenticide residues in 31% of the carcasses analysed. Polecats are particularly vulnerable because of their use of farmyards and farm buildings for hunting, especially in the winter. However, the results may be biased against rodenticide-poisoned individuals as most carcasses were road casualties ('Problems with Rodenticides', *British Wildlife* 11(3) February 2000). See section on Wildlife Poisoning.

Lutra lutra **Otter** (24,1?)

In 2000 the North Somerset Otter Group was formed. This is a group of volunteers co-ordinated by Alison Washbrook of the Avon Wildlife Trust. Each member of the group has been trained in recognising Otter signs and surveys a stretch of river in North Somerset four times a year. All surveys take place on the same weekend. The records below show a population that is moving into the area. Signs of Otters (spraints or footprints) were found at the following locations: 4163, 4165, 4269, 4364, 4463, 4471, 4563, 4567, 4573, 4574, 4668, 4674, 4769, 4861, 4871, 4875, 5060, 7756, 7766. Records supplied by Alison Washbrook, North Somerset Levels and Moors Biodiversity Officer with the Avon Wildlife Trust.

Records were received of tracks and spraint recorded at Chew Magna (5762), Stanton Drew Bridge (5963) and Bye Mills Bridge (6163) all on 20 July (RLB and SR). In addition records of Otters were received from the River Avon at Warleigh (7865) 2 individuals reported in August, River Chew at Compton Dando (6464) droppings seen on 31 August and 17 December, River Chew at Woollard Bridge (6364) droppings seen on 17 December (TK & JK). The spread of Otters back into the area even made it into the local press, 'Otters on the way back' (*Western Daily Press*, 5 August).

Vic Simpson of the MAFF Veterinary Investigation Unit in Truro has been carrying out a long-term study of Otters by undertaking post mortems of casualties in the South West of England. He found that of the 77 animals studied, 64 died as a result of road traffic accidents. A surprising finding has been that there is a high level of aggression between otters. 16.5% of the Otters examined had bite wounds, 8 animals had died as a result of them. One important finding was of a male Otter killed in a road traffic accident along with another male. One of the Otters had an Otter cub (estimated to be about 3 weeks old) in its stomach. A lactating female was later found to be dead nearby. Usually the female would defend the cubs fiercely so this could explain what is the first reported case of male infanticide in Otters (Wildlife Reports, *British Wildlife*, 11(5) June 2000).

Zoologists at Oxford have found that 67% of 673 Otter road casualties between 1971 and 1996 occurred within 100m of either fresh water or the sea and that

trunk roads and A roads, which make up 13% of the road network, accounted for 57% of deaths. A large proportion of deaths happened on bridges across streams. The Highways Agency have incorporated a series of recommendations to help reduce the number of Otter casualties into their Design Manual for Roads and Bridges and work on modifying the 600 or so crossings on the road network (in England) is to start in 2002. (*BBC Wildlife* 18 Jan 2000).

Meles meles **Badger** (77,56)
Records of road casualties were from 53 1-km squares.

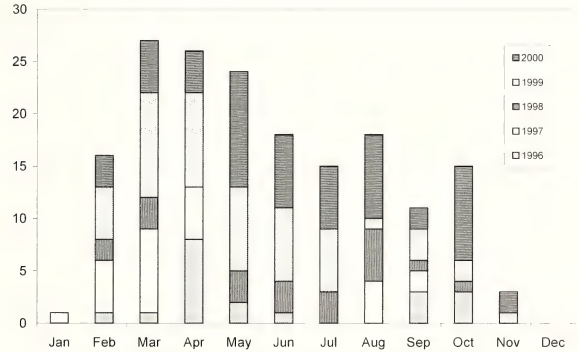


Figure 2. Number of Badger Road Casualty Records 1996-2000

Five years of Badger road casualty figures with 174 records to date show a large peak in March and April (peak breeding season) with a smaller peak in August (dispersal of young) (Figure 2). It is interesting to note the complete lack of Badger road casualty records in December and only three records for November and a single record for January. This is the time of year when Badgers are at their least active with the pregnant females underground in their setts prior to giving birth to cubs in February and March. It is thought that 50,000 Badgers are run over on the roads in Britain each year. (*Mammal News* 121 7 Spring 2000).

Other Badger records came from an active sett (3357), 2 seen in Cheddar Wood on 4 September (4454), footprints in mud (4469), garden damage (4476), an active sett (4561), footprints in mud (4569), active sett (5473), active sett, has been in the railway bank for 32+ years (5485), two adults and a cub seen emerging from sett on 7 September (5575), up to three observed regularly in

garden between June and November; on three occasions observed feeding on peanuts in the company of three foxes (5585), active sett (5862), sett (6161), latrines (7374, 7475 and 7776) , two active setts (7784). [AB, PJC, P & BF, VH, TK & JK, JMM, DP, SP, JCR, RGS, DT, MT]. The Breeding Bird Survey produced 18 additional records.

A legal judgement from Queen's Bench Divisional Court (20 June 2000) defined a Badger sett more fully than in the Protection of Badgers Act 1992. It said that a Badger sett did not include the area up to and including the surface area above the system of tunnels and chambers. It states that the term refers to the tunnels and chambers created by badgers and the areas immediately outside the entrance holes to those tunnels and chambers and it might also apply in other circumstances, for example where Badgers occupied culverts or disused sheds as their shelter or refuge. (*The Times*, June 2000).

Badgers and Bovine Tuberculosis. As in previous years the Badgers and bovine TB debate continues unabated. 'Why must Badgers Die? The Government is breaking its own laws and is slaughtering Badgers to see if they carry bovine TB. Is this justified?' asked *The Times* on 21 November 2000.

By the end of 2000 all ten of the proposed Badger culling field trial areas were up and running. The trial is designed to compare three culling treatments (proactive, reactive and no cull) in 30 areas of around 100 square km each, grouped in triplets – hence the ten areas. The areas are Gloucester/Hereford, Devon/Cornwall, East Cornwall, East Hereford, North Wiltshire, west Cornwall, Staffordshire/Derbyshire, Devon/Somerset, Gloucestershire and Devon. (*MAFF News Releases 85/00* and *275/00* and *Hansard Written Answers* 3 October 2000).

In the trial areas, the setting of cage traps to catch Badgers has resulted in a number of other species also being caught. In answer to a parliamentary question the following data were released (*Hansard Written Answers* 9 May 2000). Up to c. May 2000 373 non-target animals and birds had been captured of which 336 (90%) were released uninjured. The 37 others were:

Species	Number found dead	Number despatched
Grey Squirrel	5	10
Pheasant	5	9
Rook	2	1
Jay	1	3
Fox	0	1

Vulpes vulpes **Fox** (71,27)
Records from 46 1-km squares.

Foxes found within the Bristol city boundary were as follows:-
1) One seen at midnight in Knoll Hill (5574) on 26 Aug (LD)
2) One seen crossing road in Sea Mills (5576) on 10 October (JCR)
3) Young Fox in good condition seen at 06.20 hrs eating food put out for birds in Arbutus Drive (5577) on 11 July (JQ)
4) Healthy looking individual seen in the Government Offices car park, Westbury-on-Trym (5778) at 17.30 hrs on 9 November (DP)
5) Three, possibly four, cubs seen playing in Charlton Road, Westbury-on-Trym (5878) at 23.25 hrs on 5 May – the first cubs seen in the area for about three years. Previously seen 'regularly' at night in the area (JRS).
6) One seen in Knole Lane (5879) on 4 May at 00.20 hrs (RGS).
[Records from RLB, AB, PJC, LD, P & BF, TK & JK, DP, JQ, JCR, JRS, RGS, DT, MT].

In addition, records from the Breeding Bird Survey were from 28 1-km squares.

The small number of Fox records from within the city boundary, 8 in 1998, 5 in 1999 and 6 in 2000, show the very slow population increase since 1996. It is estimated that following the arrival of sarcoptic mange in the spring of 1994, less than 3% of Bristol's Foxes survived. Before mange arrived there were 33 Foxes per square km; even now, four years after the last Fox disappeared from the Bristol University study area there are only 1.3 per square km. This very slow rate of population recovery has been puzzling scientists at Bristol University. Stephen Harris and Tabetha Newman have been monitoring the recovery of the Bristol Fox population for the past two years. Despite their smaller numbers she has found that Foxes are still defending territories but that the defended areas are seven times bigger than they were before the arrival of mange. Territories are now about one and a half square km in size. The behaviour of the Foxes has also markedly changed. Foxes used to criss-cross their territories by night, visiting about 60% of the area each night. Now they visit only about 40% of their territory and rarely re-cross their route. Whereas before mange there were few areas that were rarely frequented, there are now large areas within Fox territories that are hardly ever visited. The social structure has also changed. Social groups are now dramatically smaller and pairs of Foxes now the norm. Another surprising finding is that despite having such large territories, Foxes are not travelling significantly further each night to defend them. These findings show how hard it is to predict what happens to a population of wild animals even in a relatively simple ecosystem such as the suburbs of Bristol let alone for the entire British countryside. It is likely to be

some years if not decades before the Fox population recovers to the numbers seen in the early 1990s ('Rise of the reds – 21st century Fox. A new order of Fox is reclaiming the streets' *BBC Wildlife* 18(5) May 2000).

It is estimated that 100,000 Foxes are killed annually on the roads in the UK. A survey is being set up to record the wildlife casualties observed during everyday journeys (Wildlife Reports, *British Wildlife*, 11(4) April 2000).

National Fox Survey
The National Fox Survey co-ordinated by Charlotte Webbon at Bristol University, undertaken between February and March 1999 and 2000, has two aims, a) To determine the size and distribution of the British rural Fox population, and b) to determine the diet of Foxes in Britain.
During the period some 513 1-km squares were surveyed and 8729 Fox scats collected. The results of the survey will provide essential baseline information on the abundance of Foxes against which future surveys can be compared to determine whether Fox numbers are increasing, as is thought to be the case (*Mammal News*, 124 7 Winter 2000). We await the analyses of the results with interest.

From the wood engraving by Thomas Bewick (1753-1828)

Artiodactyla (deer)

Cervus elaphus **Red Deer** (1,0)
Unconfirmed report from 7569 (Breeding Bird Survey).

Capreolus capreolus **Roe Deer** (51,31)
Records were from 22 1-km squares. Adult roe are often seen on Denny Island, Chew Valley Lake (5760). A fawn was seen there (for the first time?) on 24 May (DW). Roe Deer are now regularly seen in Leigh Woods (RLB). Up to three seen at Max Bog (4057) between January and April. [Records from RLB, AB, PJC, P & BF, TK & JK, RGS, DT, MT, DW]. The Breeding Bird Survey produced an additional 30 records

Dama dama **Fallow Deer**.(0,2) No records outside deer parks.

Muntiacus reevesi **Chinese Muntjac Deer** (0,1) No records this year.

Exotics

Beaver release in Scotland
The saga of the re-introduction of the European Beaver *Castor fiber* continues. Scottish Natural Heritage has named the Knapdale area in Argyll as a possible trial site for re-introduction. The forest is owned by the Forestry Commission and managed by Forest Enterprise. The interactions between Beavers and modern forestry will be studied. The trial will last 5 years and will decide whether a full re-introduction can go ahead.

Legislation

In a response to a parliamentary question on animal welfare prosecutions it was stated that in the period 1989 to 1999 the numbers of prosecutions under particular wildlife legislation were:- Wild Animals (Protection) Act 1996, 15 (10 convictions); Protection of Badgers Act 1992, 93 (39 convictions); Deer Act 1991, 96 (48 convictions); Conservation of Seals Act 1970 1 (No convictions). (*Hansard Written Answers* 28 July 2000).

The Fur Farming (Prohibition) Act 2000 came into force on 23 November 2000. This act prohibits the keeping and slaughter of animals (in this country primarily Mink) for the value of their fur from 1 January 2003. As of 1 December 2000 there were 13 Mink farms in England and none in the rest of Great Britain (*MAFF News Release* 423/00).

A Bill to make Hare coursing illegal, the 'Hare Coursing Bill', was presented to the House of Commons on 10 January 2000.

A Bill to make it illegal to hunt wild mammals with dogs, the 'Wild Animals (Hunting with Dogs) Bill' was presented to the House of Commons on 6 April 2000. The House of Commons Committee looking into the practical aspects of different types of hunting with dogs and its impact on the rural, economy, agriculture and pest control came up with some interesting data (Report of the Committee of Inquiry into Hunting with Dogs in England and Wales CM4763 – the 'Burns Report'). There are about 200 registered packs of Fox hounds in England and Wales, which hunt Foxes. They kill an estimated 21,000 to 25,000 Foxes per year. There are three registered staghound packs in the Devon and Somerset area. They kill about 160 Red Deer each year in total, excluding injured deer, which they dispatch. This represents about 15% of the number that need to be culled each year to maintain a stable population. There are about 100 registered packs of hounds (beagles, bassets and harriers), which hunt Hares. They kill about 1,650 Hares a season, which represents a very small percentage

of the number killed by shooting. There are some 24 registered Hare coursing clubs, which kill about 250 Hares each season. Illegal Hare coursing is however widespread in some areas. The 20 Mink hound packs kill somewhere between 400 and 1,600 Mink in a season.

Wildlife poisoning

Investigations into the declining numbers of Weasels and Stoats trapped by gamekeepers as recorded by the Game Conservancy Trust has implicated, amongst other factors such as agricultural intensification and the loss of rough grassland and hedges, the widespread use of anticoagulant rodenticides. These highly toxic chemicals are used to control Brown Rats and House Mice on 80% of arable farms in Britain. Further work by Robbie McDonald, formerly of Bristol University, on the effects of rodenticides on non-target species such as the Weasel and Stoat has revealed the presence of traces of these chemicals in the livers of 23% of Stoats and 30% of Weasels collected from lowland Britain (McDonald, 2000). This is surprising as rats and mice are very rarely eaten by either species. In his recent investigations Robbie McDonald found that Stoat diet consisted of 65% Rabbits, 16% voles and 17% birds and birds' eggs. Weasel diet was 25% Rabbits, 68% voles and Wood Mice and 5% birds and birds' eggs. This meant that not only were non-target animals picking up rodenticides, but non-target prey species, such as Rabbits, Voles and Wood Mice were also routinely exposed. He suggests that rodenticide usage will have to be modified to prevent such large-scale non-target effects.

Compiled by Mary J. Trump and David P. C. Trump
Windrush, West End Lane, Nailsea, Bristol BS48 4DB
e-mail: d.m.trump@tinyworld.co.uk

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PHENOLOGY 110 YEARS ON

R.L. Bland
President of the Ornithological Section, BNS

Phenology is the study of organisms as affected by climate, especially dates of seasonal phenomena, like the opening of flowers

Between 1890 and 1893 members of the BNS kept detailed phenological records. They recorded the dates of bud break and first flowering of a list of plants, the first appearance of a variety of insects, and noted the activities of birds. A very large and detailed set of plant records were kept, and from them, dates for 38 common and easily recognised species have been selected and compared with dates collected in the past four years.

There are various problems with the data. 1893 was a year with an exceptionally warm spring, even by modern standards, but I have included it. Not every species was recorded every year a century ago, and the same is true of my records for the past four years. I only used events between 1st Jan and 31st May

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Event	1997-2000	1890-1893	Difference Days
	Average Date		
Frog spawn	9-Feb	9-Mar	30
Hawthorn bud break	7-Feb	27-Mar	43
Snowdrop flower	24-Jan	14-Mar	48
Hazel catkins open	31-Jan	14-Feb	21
Celandine flower	17-Feb	13-Mar	23
Daffodil flower	20-Feb	6-Apr	44
Blackthorn flower	3-Mar	11-Apr	43
Marsh Marigold flower	16-Mar	4-Apr	22
Bluebell flower	4-Apr	16-Apr	14
Horse Chestnut flower	7-Apr	4-May	22
Lilac flower	10-Apr	2-May	20
Beech bud break	11-Apr	30-Apr	19
Hawthorn flower	13-Apr	9-May	27
Laburnum flower	16-Apr	11-May	21
Whitebeam bud break	18-Apr	11-Apr	3
Ox-eye Daisy flower	2-May	19-May	18

Table 1. Average dates of 16 'events'

Table 1 shows the general conclusions. It gives the average date of events in Bristol, 1997-2000, in modern date order, compared with the average date of the same events 1890-1893, and the last column shows the difference in days between the two. The greatest difference, 48 days, is in the opening of the Snowdrop, which today is always in January, but in the 1890s occurred as late as 23rd March. Daffodils then flowered at the start of April, whereas the average today is mid-February. This may of course be the result of improved daffodil breeds, but that cannot be true of Blackthorn flowering, which today occurs on average in early March, but a century ago the average was 11th April.
Events that occur rather later in the season are now earlier by a smaller number of days. Beech bud-burst is 19 days earlier, on 11th April rather than 30th April, and Lilac flowers are first seen on 10th April, compared with 2nd May. Ox-eye Daisy flowers can now be seen on 2nd May, whereas then it was 19th May.

Temperature is probably the most important factor in these differences. There are detailed weather records for the 1890s, and I compared the average maximum daily temperature then with that for the 1990s. Figure 1 below shows the annual pattern of monthly maximum temperatures, and Figure 2 the differences in degrees C. Essentially January, February and March are each 2°C warmer today, and April and May are 1°C warmer. The biggest change, however, is in autumn temperatures. October and November are both 2.5°C warmer, and December is 4.5°C warmer. As soil temperature rather than air temperature is what controls the emergence of bulbs, it is un-surprising that Snowdrops are now so much earlier.

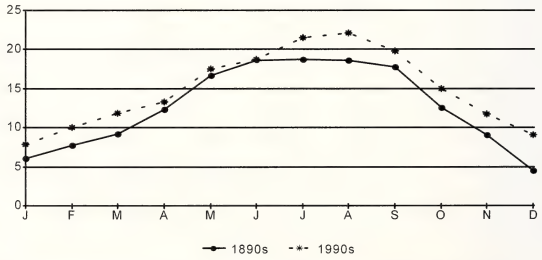


Figure 1 Monthly average maximum temperatures, 1890s and 1990s

It is a great pity that the interest in phenology seems to have faded after 1893. Long runs of appropriate data are needed before trends become clear. The fact

that there are only four years of data, one of which, 1893, was by all accounts a wholly exceptional year for the times, is regrettable. Let us hope that today we will collect a better set of data, to enable the impact of climate change in the next century to be measured with greater precision. Meanwhile the data from the 1890s is a vivid demonstration of how striking the long-term change has been.

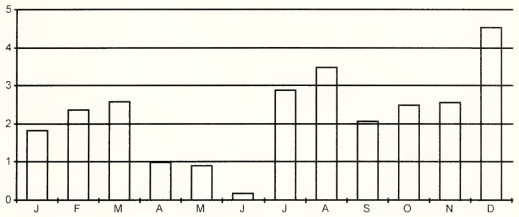
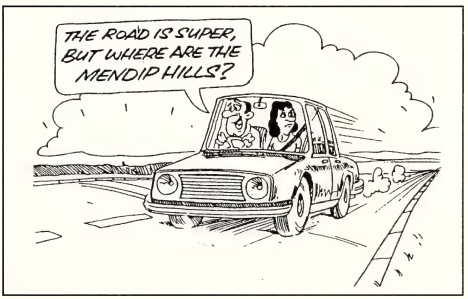


Figure 2 Difference in °C in average monthly maximum temperatures between 1889-93 and 1997-2000.

R.L. Bland
President of the Ornithological Section, BNS
11 Percival Road, Clifton, BS8 3LN
email: rbland1@compuserve.com



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The colour plates

Plate 1 **Upper**: *Left*: Otter foot print in soft sand. The foot print of a Mink may also be seen to the right. *Right*: Otter left front paw. **Lower**: Harvest Mouse in a tennis ball at Chew Valley Lake Nature Reserve, by kind permission of Pauline Kidner from 'Secret World', East Huntspill.

Plate 2 **Upper**: Lucombe Oak at Blaise Castle House. This oak is a hybrid between the Cork Oak *Quercus suber* and the Turkey Oak *Quercus cerris*. **Lower**: Small-leaved Lime *Tilia cordata* on the Downs in Bristol, showing the erect flowers. This tree is one of the parents of the Common Lime *Tilia x europaea*. The other parent is the Broad-leaved Lime *Tilia platyphyllos* Lime was used as a source of bast, woven into rope – at one time a major industry in Bristol

Plate 3 **Upper**: *Nymphula stagnata* Beautiful China Mark Moth, one of the more attractive of the Pyralid moths. Frequent in the wetlands of the Gordano Valley, where this photograph was taken. The larva feeds on aquatic plants. **Lower**: *Pyrgus malvae* Grizzled Skipper - Dolebury Warren. A local butterfly of calcareous grassland. The caterpillar feeds on Wild Strawberry.

Plate 4 **Upper**: *Asilus crabroniformis*, Hornet Robber fly male with *Aphodius rufipes* a dung beetle.- Weston Moor ,Weston Moor. On cow dung, used as a vantage point. **Lower**: *Megachile willughbiella*, a leaf cutter bee and probably the most frequent to be found on roses in the gardens of Bristol. Leaf cutter bees were shown in *British Wildlife* vol. 10, (6) August 1999.They line their nests with leaf segments and disks cut from a variety of plants.

The photographs on Plate 1 (upper) were by Alison Washbrook, and (lower) by Sam Thompson (The Wildlife Trust) , on Plate 2 by Tony Titchen and on Plates 3 and 4 by David Gibbs

Plate 1

Plate 2

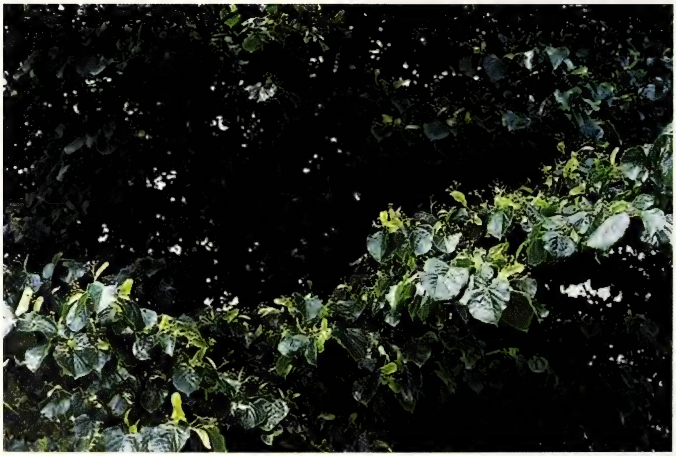


Plate 3

Plate 4

Proceedings of the Bristol Naturalists' Society (2000) ***60****: 33-45*

BRISTOL BOTANY IN 2000

Professor A.J. Willis

A general overview of flowering plant records in the Bristol Region.

The year 2000 goes down in history as the wettest in England and Wales for more than a century, rainfall being last exceeded as long ago as 1872; indeed the autumn quarter was the wettest since rainfall recording began some 300 years ago. The annual rainfall for Long Ashton was 1249 mm, exceeding the totals of the very wet years 1993, 1998 and 1999, and being about 44% above the long-term (1961-1990) average. Only January, March and June had lower than normal rainfall, with April and October being more than twice the average and the period August to December having nearly 77% more rain than average, leading to severe flooding in the Somerset Levels. There were 214 days in the year with more than 0.2mm rain, no month having fewer than 10 days with this amount of rainfall. Temperatures were, however, favourable, the mean minimum temperature for every month being above normal, and overall 1.0ºC higher than average. There were 28 days with frost, nearly half of these in January. Mean maximum temperatures at Long Ashton Research Station (to which the above records relate) were, however, overall only 0.4ºC higher than normal and 0.8ºC lower than usual in July.

Flowering times in 2000 appear to be quite similar to those in 1999. The milder than normal first three months led to flowering, for example, of *Daphne laureola* **Spurge-laurel** on Banwell Hill at the start of January as well as *Galanthus nivalis* **Snowdrop** in mid January at Uphill. In early February there were magnificent displays of Snowdrops along the River Chew from Coley to South Widcombe and at Stoke Lane valley; *Erophila verna* **Common Whitlowgrass** was starting to flower on Brean Down. By mid February *Viola odorata* **Sweet Violet** was in flower in Cheddar Wood and in early March on Brean Down; *Caltha palustris* **Marsh Marigold** and both *Chrysosplenium oppositifolium* **Opposite-leaved Golden Saxifrage** and *C. alternifolium* **Alternate-leaved Golden Saxifrage** were well in flower at Stoke Lane valley. Mild autumn weather seems to prolong flowering in some species; in late October *Filipendula ulmaria* **Meadowsweet**, *Centaurea nigra* **Common Knapweed** and even *Carex disticha* **Brown Sedge** were in flower on Tealham and Tadham Moors (all records RSC).

The Flora of the Bristol Region was issued by Pisces Publications in late 2000, being Wildlife of the Bristol Region: 1, under the copyright of the Bristol Regional Environmental Records Centre (see review by R. Bland in this issue of *Nature in Avon*). It is largely written by Ian P. Green, Rupert J. Higgins, Clare

Kitchen and Mark Kitchen and edited by Sarah L. Myles. This book stems from the Avon Flora Project initiated over 17 years ago, being based on the short-lived county of Avon, but this fortunately coincides fairly closely with the area covered by J. W. White's *The Bristol Flora of 1912*. The new Flora gives a very full record, with more than a thousand 'dot' maps of the occurrence of plants recorded over the last 15 years or so, hence providing much important information relevant to conservation. Those interested in changes in plant distribution over the longer term, however, will need to consult earlier literature. Not surprisingly, the preparation of the new Flora has given an incentive for field searches and also examination of herbarium material, resulting in a substantial assemblage of new records for the area reported in the present article. For example, *Hieracium trichocaulon* **Hawkweed** is now shown to have been known since 1917 from East Harptree Combe and it is still present there. *Euphorbia portlandica* **Portland Spurge**, typically a coastal plant, found at Winford, is a first record for North Somerset. Of note also is *Silene gallica* **Small-flowered Catchfly** discovered in a field at Nailsea after clearance of brambles. *Potamogeton coloratus* **Fen Pondweed** found at Shapwick, but not recorded on the Somerset Levels for many years, is a welcome indication of the long-persistence of plants. A large contingent of alien plants is included this year. The stonework of Cheddar Reservoir has yielded numerous records of both native and alien species. Pride of place this year goes to the two Composites *Eupatorium purpureum* and *Melampodium montanum* (a Mexican plant), both of which are first records for the UK. First records for the Bristol region include *Persicaria capitata* **Pink-headed Knotweed**, *Pterocarya fraxinifolia* **Wingnut** and the grass, *Ceratochloa carinata* **California Brome.**
The extensive topographical and vegetation changes in the area of the saltmarsh at Berrow, since its inception in about 1910, are described and discussed in 'The changing structure and vegetational history of the 85-year-old saltmarsh at Berrow, North Somerset' by AJW in *British Saltmarshes*, eds B.R. Sherwood, B.G. Gardiner and T. Harris, 2000, pp. 65-80, Forrest Text, Ceredigion, UK, for The Linnean Society.

Also issued at the end of 2000 was the New Flora of Gloucestershire, Part 1, by the late Stephen Bishop, published by the Gloucestershire Naturalists' Society. This Flora was edited by Richard Cooper, with assistance from Mark and Clare Kitchen. It covers accounts of over 340 species, from *Lycopodium clavatum* **Stag's-horn Clubmoss** to *Descurainia sophia* **Flixweed** and includes associated tetrad maps.
Names of contributors associated with several records or plant determinations are abbreviated thus:
J.F. Burton (JFB), P.J. Chadwick (PJC), E.J. Clement (EJC), R.S. Cropper (RSC), I.P. Green (IPG), P.R. Green (PRG), R.J. Higgins (RJH), L. Houston

(LH), C.W. Hurfurt (CWH), C. Kitchen (CK), M.A.R. Kitchen (MARK), J.P. Martin (JPM), E.J. McDonnell (EJMcD), P.J.M. Nethercott (PJMN), E.G.M. Niblett (EGMN), P. Quinn (PQ), Dr J.S. Rees, (JSR), A. Stevenson (AS), A. Town (AT), A.J. Willis (AJW).

The area covered by this report is essentially that defined by J.W. White for his *Flora of Bristol* (1912). The eastern boundary is taken as the old boundary of Wiltshire where it meets the old boundaries of both Gloucestershire and Somerset. The southern limit is taken as approximately the course of the River Brue along some of its length. The area comprises the northern part of the Watsonian vice-county of North Somerset (v.c. 6) and the southern part of West Gloucestershire (v.c. 34). In the following records these parts are designated **S** and **G** respectively.

Plant names are in accordance with C. Stace *New Flora of the British Isles*, 2nd edition, 1997.

Adiantum capillus-veneris L. **Maidenhair Fern**. Abundant on damp wall near wagon shed, American Museum, Claverton, **S**, JPM.

Ranunculus lingua L. **Greater Spearwort**. Small patch in a ditch by new bridge into field, Lawrence Weston road, Avonmouth, **G**, PQ. Abundant in small pond, over 1 metre tall, North Common, Warmley, **G**, CWH.

Aquilegia vulgaris L. **Columbine**. By track, Ashen Plains Wood, Dursley, **G**, and on side of path, Westridge Wood, Wotton-under-Edge, **G**, RSC. In 1997, adjoining path, edge of wood, Ashton Park, Bristol, **S**, JFB.

Fumaria officinalis L. ssp. *officinalis* **Common Fumitory**. In good quantity, set aside field, near Frenchay Hospital, Winterbourne C. P., **G**, MARK & CK.

Cochlearia danica L. **Danish Scurvygrass**. This plant now seems to be spreading to single carriageway roads as well as major ones. Small quantity, Little Sodbury, **G**, JSR. Flowering well and scattered along verge of Portway, Bristol, **G**, RSC. Small quantity, between cobbles of road, Canons Marsh, Bristol, **G**, MARK & CK. Plentiful along margins of A38, East Brent, **S**, RSC.

Draba muralis L. **Wall Whitlowgrass**. Still flourishing on the churchyard wall, Lasborough, **G**, RSC, also MARK & CK. First noted here in 'Bristol Botany in 1973', p. 20, as having been known by Miss Huntley for several decades.

Rorippa microphylla (Boenn.) Hyl. ex Á. & D. Löve **Narrow-fruited Watercress**. A few plants around Brimble Pit Pool, west of Priddy, **S**, IPG & AS. Also plentiful *Bidens cernua* L. **Nodding Bur-marigold**, *Lythrum portula* (L.) D.A. Webb **Water-purslane**, *Apium inundatum* (L.) Rchb. f. **Lesser Marshwort** and a few plants of *Epilobium palustre* L. **Marsh Willowherb**, *Myosotis laxa* Lehm. **Tufted Forget-me-not** and *Ranunculus hederaceus* L. **Ivy-leaved Crowfoot**, IPG & AS.

Silene gallica L. **Small-flowered Catchfly**. Several plants in area recently disturbed by removal of brambles, pasture field, Nailsea, **S**, PQ. The previous

record for v.c. 6 was at Loxton Hill in 1951, as *S. anglica* ('Bristol Botany in 1951', p. 243), and for v.c. 34 was at Shirehampton Park in 1983 (*'Bristol Botany in 1983*', p. 66).

Silene gallica

Dianthus armeria L. **Deptford Pink**. Persistent and flowering at Axbridge, **S**, RSC.

Spergula arvensis L. **Corn Spurrey**. Abundant in arable fields near Frenchay Hospital, Winterbourne C.P., **G**, MARK & CK.

Malva neglecta Wallr. **Dwarf Mallow**. In legume fodder crop field, between Nailsea and Tickenham, **S**, AT, conf. AJW.

Erodium moschatum (L.) L'Hér. **Musk Stork's-bill**. Abundant along rocky bank, Brandon Hill, Bristol, **G**, MARK & CK.

Rhamnus cathartica L. **Purging Buckthorn**. One fine shrub, Fry's Hill, Mendip, near Axbridge, **S**, PJMN.

Genista anglica L. **Petty Whin**. One bush by pond, Westerleigh Common, **G**, M. Evans & R. Edmondson.

Ononis repens L. **Common Restharrow**. Several white-flowered plants growing with the usual colour form, Sand Bay, **S**, RSC.

O. spinosa L. **Spiny Restharrow**. Kingston Seymour, **S**, RSC.

Deptford pink

Medicago sativa L. ssp. falcata (L.) Arcang. **Sickle Medick**. Small patch, suggesting seed scattered previously, Cock Road Ridge, Conham, Bristol, **G**, CWH. Also small patch of *Echium vulgare* L. **Viper's-bugloss**.

M. arabica (L.) Huds. **Spotted Medick**. An almost pure stand over a large area, Conham Park, Bristol, **G**, CWH.

Lathyrus sylvestris L. **Narrow-leaved Everlasting-pea**. A few large patches in hedge, Castle Lane, Wookey, **S**, RSC.

Rosa agrestis Savi **Small-leaved Sweet-briar**. In an exhaustive search a few scattered bushes were found at higher altitudes away from the main colony of this rose on Wavering Down, Mendip, near Compton Bishop, **S**, PJMN.

Ribes uva-crispa L. **Gooseberry**. One bush on stonework of Cheddar Reservoir, **S**, IPG.

Daphne mezereum L. **Mezereon**. In 1991, Baden Hill, northeast of Tytherington, **G**, S.M. Hedley.

Daphne mezereum

D. laureola L. **Spurge Laurel**. A recent arrival in woodland, Old Sneed Park Nature Reserve, Bristol, **G**, PJMN. This shrub is rare on the Clifton side of the Avon Gorge but plentiful on the Leigh Woods side.

Epilobium roseum Schreb. **Pale Willowherb**. Several plants in garden border, Burnham-on-Sea, **S**, RSC.

Euphorbia portlandica L. **Portland Spurge**. In cracks of garden path, Winford, **S**, Mrs M. Webster, conf. IPG & A. Radcliffe-Smith. The specimen is in Herb. I.P. Green. This is a first record for v.c. 6.

Rumex palustris Sm. **Marsh Dock**. With *R. maritimus* L. **Golden Dock** in peat cutting, Shapwick Heath National Nature Reserve, **S**, IPG & EJMcD. Also both these species of Dock flowering and fruiting on Catcott Heath, **S**, RSC.

Ulmus x *vegeta* (Loudon) Ley (*U. glabra* Huds. x *U. minor* Mill.) **Huntingdon Elm**. During the year two large trees died from Dutch Elm disease and were removed, Clifton Down, Bristol, **G**, MARK & CK.

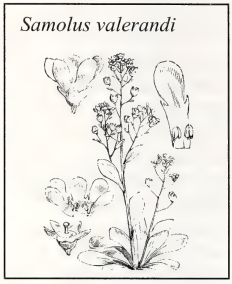
Cowslip

Calluna vulgaris (L.) Hull. **Heather**. A small patch on grassy clearing on site of Richmont Castle, East Harptree, **S**, IPG & EJMcD. Nearby were a few plants of *Campanula patula* L. **Spreading Bellflower**.

Limonium binervosum (G.E. Sm.) C.E. Salmon **Rock Sea-lavender**. About 30 clumps on sea wall, near mouth of the River Brue, West Huntspill, **S**, RSC. Known here in the early 1980s, destroyed by construction of the new sea wall but now recolonising well.

Primula veris L. **Cowslip**. Although possibly in decline in some places, numbers in some 17 colonies were counted in the vicinity of Tormarton, with well over 100 flowering plants at several sites, including Ebb Down Farm and Park Farm, **G**, PJC. In 1997, plentiful flowering on Old Down, Tockington, **G**, JFB. Very large numbers at Sand Point, **S**, PJC.

Samolus valerandi L. **Brookweed**. A few plants where water dripping down cliff-face, Ladye Bay, Clevedon, **S**, JFB.


Samolus valerandi

Centaurium erythraea Rafn **Common Centaury**. The white-flowered form fairly frequent with the commoner pink, Shute Shelve, Mendip, near Axbridge, **S**, PJMN.

Gentianella amarella (L.) Börner **Autumn Gentian**. A few plants on south side of Fort, Dolebury Warren, **S**, RSC.

Polemonium caeruleum L. **Jacob's-ladder**. Established in paddock, where avoided by horses, Pilning, **G**, JPM.

Calystegia sepium (L.) R. Br. ssp. *sepium* f. *colorata* (Lange) Dörfl. **Hedge Bindweed**. Creeping over bushes by footpath between houses and pumping station, Clevedon, **S**, IPG, conf. Dr R.K. Brummitt. This form has bright pink flowers; nearby was the usual white-flowered form.

Cuscuta europaea L. **Greater Dodder**. Several flowering patches on nettles along north bank of the river Avon, Swineford, **S**, RSC.

Orobanche hederae Duby **Ivy Broomrape**. In 1991, magnificent specimens on Ivy in shrubberies bordering the north wall of Herbert Gardens, Clevedon, **S**, JFB. About 30 plants at base of wall, Mells, **S**, J. Maxwell, det. IPG. Also here was *Geranium rotundifolium* L. **Round-leaved Crane's-bill** and on nearby wall *Linaria repens* (L.) Mill. **Pale Toadflax**, PRG & IPG.

Verbena officinalis L. **Vervain**. On mostly bare ground, near railway terminus, Severn Beach, **G**, PJMN. Also in rough grassland, Shute Shelve, Mendip, near Axbridge, **S**, PJMN.

Mentha arvensis L. **Corn Mint**. On stonework, Cheddar Reservoir, **S**, IPG.

Prunella laciniata (L.) L. **Cut-leaved Selfheal**. Persistent but thinly scattered over a wide area of calcareous grassland, Tytherington, **G**, RSC. Also one small plant of the hybrid *P. laciniata* x *P. vulgaris* L. (*P. intermedia* Link).

Stachys x *ambigua* Sm. (*S. sylvatica* L x *S. palustris* L.) **Hybrid Woundwort**. Large patch by footpath on open hillside, Sims Hill, Winterbourne C.P., **G**, MARK & CK.

Lamium amplexicaule L. **Henbit Dead-nettle**. In small quantity, set aside field, near Frenchay Hospital, Winterbourne C.P., **G**, MARK & CK.

Plantago coronopus L. **Buck's-horn Plantain**. On salt-enriched turf, central reservation of A4018, Cribbs Causeway, Brentry, Bristol, G, MARK & CK.

Galium odoratum (L.) Scop. **Woodruff**. Brown's Folly, Bathford Hill, **S**, RSC.
Dipsacus pilosus L. **Small Teasel**. Flowering by car park, American Museum, Claverton, **S**, JPM.
Senecio jacobaea L. **Common Ragwort**. A colour form, one plant with pale rays, among very many plants with normal yellow rays, Severn Beach, **G**, PJMN.
Cirsium eriophorum (L.) Scop. **Woolly Thistle**. Several plants on rough slope near road, Bonnyleigh Hill, **S**, RSC.
Centaurea cyanus L. **Cornflower**. In field with legume fodder crop between Moorend Spout, Nailsea and Tickenham Church, **S**, AT. (see cover photograph)
Hieracium trichocaulon (Dahlst.) Johansson. **Hawkweed**. In 1917, this Hawkweed was very abundant on the aqueduct,.East Harptree Combe, East Harptree, **S**, B.W. Tucker, det. at Kew. Also in 1989, R.M. Payne, det. J.G. Keylock, and in 2000, IPG & EJMcD.

Woodruff

H. rigens Jordan In 1997, old railway line, Paulton, **S**, and disused railway line, Newton St Loe, **S**, both PRG & IPG, det. D.J. McCosh. Both localities previously noted in 'Bristol Botany in 1980', p. 104, as recorded by D.E. Green and R.D. Randall respectively.
Crepis biennis L. **Rough Hawk's-beard**. A single plant by path adjoining Blagdon Lake, **S**, EJMcD.
Baldellia ranunculoides (L.) Parl. **Lesser Water-plantain**. Flowering and fruiting in Walton Moor, and Edington Heath, but only one plant at Catcott Heath, all **S**, RSC. Persisting at these previously known localities, but becoming very rare in v.c. 6.
Potamogeton coloratus Hornem. **Fen Pondweed**. In damp area of old peat cutting, Shapwick Heath National Nature Reserve, **S**, IPG & EJMcD, det. Dr N.T.H. Holmes. This is the first record of this pondweed for the peat moors since 1970 when reported near Glastonbury ('Bristol Botany in 1970', p. 18).
Groenlandia densa (L.) Fourr. **Opposite-leaved Pondweed**. Abundant in pool, Lower Kilcott, **G**, JPM.
Ruppia maritima L. **Beaked Tasselweed**. In 1994, playing field, Nibley Road, Shirehampton, **G**, PQ.
Juncus compressus Jacq. **Round-fruited Rush**. Two patches on stonework, Cheddar Reservoir, **S**, IPG & AS.
Spiranthes spiralis (L.) Chevall. **Autumn Lady's-tresses**. One plant, Walton Common, Gordano, **S**, EGMN.

Platanthera chlorantha (Custer) Rchb. **Greater Butterfly-orchid**. Two flower spikes, Westridge Wood, Wotton-under-Edge, **G**, RSC.

Ophrys apifera Huds. var. *trollii* (Hegetschw.) Druce **Wasp Orchid**. Four plants, with three typical Bee Orchids, Cold Ashton, **G**, PJC. Nearby 20 normal Bee Orchids in rather exposed location, Sand Point, **S**, Dr R.A. Avery.

Anacamptis pyramidalis (L.) Rich. **Pyramidal Orchid**. Single flower spikes in the Marshfield-Tormarton area: Rushmead Lane, Marshfield; bottom of Cadwell Hill, West Littleton; and Tolldown Farm, **G**, PJC. Good specimens on grassy road-bank, near St George's Hill, Easton-in-Gordano, **S**, EGMN. About 20 on slope near road, Shute Shelve, **S**, and a few on verge at M5 interchange, St Georges, **S**, RSC.

Anacamptis pyramidalis

Carex depauperata Curtis ex With. **Starved Wood-sedge**. Only two plants in 1985, but now over 20 tussocks, several quite large, showing the success of transplants and conservation, Axbridge, **S**, RSC.

C. disticha Huds. **Brown Sedge**. In damp field between Paywell Farm and Hillcroft Farm, Charterhouse, **S**, Pam Millman, conf. IPG.

Glyceria maxima (Hartm.) Holmb. **Reed Sweet-grass**. A dense stand in the marginal water of part of pond, Old Sneed Park Nature Reserve, **G**, PJMN. The reserve was declared in 1995. The pond was made some 100 years ago and the grass, perhaps originally planted (unexpected in this urban environment), has been established for many years.

Leymus arenarius (L.) Hochst. **Lyme-grass**. Large flowering patch on sand dunes, Uphill, **S**, RSC.

Calamagrostis epigejos (L.) Roth **Wood Small-reed**. Very plentiful and tall-growing, associated with gorse, middle and upper parts of Shute Shelve, near Axbridge, **S**, PJMN.

Aliens

Pteris cretica L. **Ribbon Fern**. On cellar wall, Bath, **S**, RJH.

Brassica rapa L. ssp. *campestris* (L.) A.R. Clapham **Wild Turnip**. A few plants and also of *B. napus* L. ssp. *oleifera* (DC.) Metzg. **Oil-seed Rape** on stonework, Cheddar Reservoir, **S**, IPG & AS. Also plentiful *Linum usitatissimum* L. **Flax**, IPG & AS.

Raphanus raphanistrum L. ssp. *raphanistrum* **Wild Radish**. In small quantity on building site, north of Coldharbour Farm, Winterbourne C.P., **G**; also small

quantity in beetroot field, Frenchay, **G**, both records MARK & CK. A single plant on stonework, Cheddar Reservoir, **S**, IPG.

Rorippa austriaca (Crantz) Besser **Austrian Yellow-cress**. On imported soil, Bradley Stoke, **G**, RJH & D. Lawrence.

Erysimum cheiranthoides L. **Treacle-mustard**. One plant in stonework, Cheddar Reservoir, **S**, IPG.

Silene armeria L. **Sweet-William Catchfly**. One plant, on bulldozed soil, Dyer's Common, northwest of Easter Compton, **G**, RJH & JPM.

Amaranthus retroflexus L. **Common Amaranth**. A single plant on stonework, Cheddar Reservoir, **S**, IPG & AS.

A. albus L. **White Pigweed**. A single plant in pavement crack in Council Estate, Bean St., Barton Hill, Bristol, **G**, JSR, det. EJC. Specimen in Herb. M.A.R. & C. Kitchen.

Chenopodium quinoa Willd. **Quinoa**. The locality for this plant given in 'Bristol Botany in 1999', p. 60, should read Bagpath (not bog path), near Wotton-under-Edge, **G**.

Geranium x *oxonianum* Yeo 'Winscombe' (*G. endressii* J. Gay x *G. versicolor* L.) **Druce's Crane's-bill**. Alongside abandoned railway-track, in grassy area near a garden, Winscombe, **S**, PJMN. This plant is described and illustrated in the R.H.S. A-Z Encyclopedia of Garden Plants (ed. C.D. Brickell), 1996, p. 465.

Dusky cranesbill

G. phaeum L. **Dusky Crane's-bill**. One plant, bank of the River Trym, Coombe Dingle, Bristol, **G**, LH, MARK & CK.

Trifolium hybridum L. **Alsike Clover**. Two plants on raised bank of the River Axe, Brean, **S**, and one small plant, Leek Beds Lane, West Huntspill, **S**, RSC.

Galega officinalis L. **Goat's-rue**. Several plants in peat cutting, Westhay Heath, **S**, A.G. Smith. Specimen in Herb. I.P. Green.

Prunus dulcis (Mill.) D.A. Webb **Almond**. In scrub on sheltered terrace, St Vincent's Rocks Gully, Bristol, **G**, LH.

Sorbus croceocarpa P.D. Sell **Orange-berried Whitebeam.** A sapling (half-metre tall) in woodland, Old Sneed Park Woodland Trust Property, Bristol, **G**, PJMN. Probably bird-sown from Sneyd Park or Downs area.

Sedum dasyphyllum L. **Thick-leaved Stonecrop**. Good colony on wall, Chipping Sodbury, **G**, JSR.

S. album L. **White Stonecrop**. High on embankment of M5 Motorway (Norton Wood side), at edge of slab of limestone rock, far from any dwelling, near Clevedon, **S**, EGMN.

Darmera peltata (Torr. ex Benth.) Voss ex Post & Kuntze **Indian-rhubarb**. Several plants by pond, Newton Park, Newton St Loe, **S**, J. Maxwell.

Epilobium ciliatum Raf. **American Willowherb**. White-flowered plants, southern edge of Ellenborough Park, Weston-super-Mare, **S**, RSC.

Sedum dasyphyllum

Coriandrum sativum L. **Coriander**. Three plants on stonework, Cheddar Reservoir, **S**, IPG & AS. Also a few plants of *Lycopersicon esculentum* Mill. **Tomato**, IPG & AS.

Petroselinum crispum (Mill.) Nyman ex A.W. Hill **Garden Parsley**. Single plant in set aside field, possible remnant of former crop, near Frenchay Hospital, Winterbourne C.P., **G**, MARK & CK. Also single plant in nearby market garden.

Persicaria capitata (Buch.-Ham. ex D. Don) H. Gross **Pink-headed Knotweed**. In December 1999 and December 2000, two plants flowering in cracks in pavement near Council Buildings, Thornbury, **G**, MARK & CK. This is a first record of this garden or pot-plant escape for the Bristol region and the third record for v.c. 34 having been recorded by S.H. Bishop in 1994 in Coleford, and by MARK & CK in 1998 in Stroud. In 1998 in pavement crack, Wells, S, A. Underhill. Now not infrequent in Somerset in pavement cracks, IPG.

Fig

Fagopyrum esculentum Moench **Buckwheat**. Two plants on stonework, Cheddar Reservoir, **S**, IPG & AS.

Cannabis sativa L. **Hemp**. Plentiful on stonework, Cheddar Reservoir, **S**, IPG & AS.

Ficus carica L. **Fig**. The top of the long-established Fig tree that survived the Bristol Blitz on the Bristol Floating Harbour near Castle Park, **G**, PJMN, was severely cut back in November because it was believed to be damaging the harbour wall. The lopping was reported in the *Bristol Evening Post*, 17th Nov. 2000. Fig trees in this locality

were first mentioned by J.W. White in Notes Supplemental to the Flora of Bristol (*The Journal of Botany*, March 1918, Vol. 56, p. 79). White referred to dwarf trees of many years' growth having sprung from a wall of the Floating Harbour Bristol Bridge in the centre of the city. The trees were also referred to in J.E. Lousley's article *Ficus carica* L. in Britain (*Botanical Society and Exchange Club of the British Isles*, Vol. XIII, Part III, Report for 1946). In post-war times there were a very few small trees on the wall. The seed may have come from a market or shop and been favoured by warm water from a former brewery, PJMN.

Pterocarya fraxinifolia (Poir.) Spach **Caucasian Wingnut**. Many young suckers, seen on B.N.S. Botanical Section meeting, naturalising around the original planted tree, by the Hazel Brook, Blaise Castle Estate, **G**, MARK & CK. This is a first record for v.c. 34.

Vinca major L. var. *oxyloba* Stearn **Greater Periwinkle**. Well established for many years on edge of pond (probably planted or discarded here) in the Old Sneed Park Nature Reserve, Bristol, **G**, PJMN. This cultivar is described in *Trees and Shrubs Hardy in the British Isles* by W.J. Bean, 8th edn, Vol. IV, 1980, p. 723 (originally described in 1930).

Amsinckia micrantha Suksd. **Common Fiddleneck**. In 1999, near the Somerset Monument, Hawkesbury Upton, **G**, Dr M. Everard, conf. EJC. In Herb. M.A.R. & C. Kitchen.

Physalis peruviana L. **Cape-gooseberry**. On Steep Holm, **S**, T. Parsons, det. Dr H. Bowen.

Verbascum phlomoides L. **Orange Mullein**. One plant by roadside, Easter Compton, **G**, RJH & JPM.

V. speciosum Schrad. **Hungarian Mullein**. One plant on road verge, near housing but not visible in gardens, A38, Ridgeway, Alveston C.P., **G**, JPM, conf. EJC. A small part of the plant is in Herb. M.A.R. & C. Kitchen. Recorded on railway bank, Wickwar, **G**, in 1954 (see 'Bristol Botany in 1954', p. 23).

Phygelius capensis E. Mey. ex Benth. **Cape Figwort**. Several plants on grassy verge, south side of Top Road, Westbury-sub-Mendip, **S**, O. Mountford. This is a first record for v.c. 6. Also one plant in gutter, High Street, Wells, **S**, PRG.

Lathraea clandestina L. **Purple Toothwort**. Extending its range, with colonies along the River Trym from Blaise Castle to Sea Mills, **G**, LH, MARK & CK. First found by R. Milne in 1991 at Blaise Castle. Also small patch on the Hazel Brook, Blaise Castle, **G**, MARK & CK.

Mentha requienii Benth. **Corsican Mint**. With *Sagina procumbens* L. **Procumbent Pearlwort**, flowering between flagstones at front of the house, American Museum, Claverton, **S**, JPM.

Salvia reflexa Hornem. **Mintweed**. One plant in pavement crack, Gloucester Road, Bristol, **G**, RJH.

Lobelia erinus L. **Garden Lobelia**. A very small colony on railway track, Sea

Mills, Bristol, **G**, PJMN.

Lonicera japonica Thunb. ex Murray **Japanese Honeysuckle**. In hedge, Pilning, **G**, JPM.

Galinsoga quadriradiata Ruiz & Pav. **Shaggy-soldier**. Locally abundant in beetroot field, Frenchay, **G**, MARK & CK.

Eupatorium purpureum L. **Joe Pye Weed**. Several plants on south bank of St Andrew's Stream, Wells, **S**, RJH, conf. IPG & EJC. A specimen is in Herb. E.J. Clement. This is a first record for the UK. Growing with it were *Eupatorium cannabinum* L. **Hemp-agrimony**, *Angelica archangelica* L. **Garden Angelica**, *Lythrum salicaria* L. **Purple Loosestrife** and *Stachys* x *ambigua* Sm. **Hybrid Woundwort**, IPG.

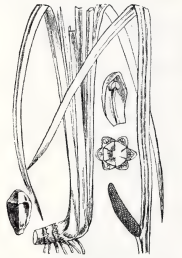
Anthemis tinctoria L. **Yellow Chamomile** In legume fodder crop field, between Nailsea and Tickenham, **S,** AT, conf. AJW.

Guizotia abyssinica (L. f.) Cass **Niger**. Several plants on stonework, Cheddar Reservoir, **S**, IPG & AS. On Herriott's Bridge, Chew Valley Lake, **S**, RJH. Also at Chew Valley Lake were the aliens *Xanthium strumarium* L. **Rough Cocklebur**, *Ambrosia artemisiifolia* L. **Ragweed**, *Crepis setosa* Haller f. **Bristly Hawk's-beard** and *Ammi majus* L. **Bullwort**, RJH.

Helianthus annuus L. **Sunflower**. A single plant on waste ground by sports field, Frenchay, **G**, MARK & CK. On stonework, Cheddar Reservoir, **S**, AS, also IPG.

Melampodium montanum Benth. One plant at base of wall, Queens Street, Wells, **S**, IPG, det. EJC. The specimen is in Herb. E.J. Clement. This is a first record for the UK. Growing with it was *Bidens ferulifolia* (Jacq.) Sweet **Fern-leaved Beggarticks**.

Acorus calamus



Acorus calamus L. **Sweet-flag**. Persistent in good quantity, but flowering sparingly, along the River Avon, Swineford, **S**, RSC.

Arum italicum Mill. ssp. *italicum* **Italian Lords-and-Ladies**. About eight plants, naturalised from adjacent dwelling, on bank by footpath at edge of wood, Westfield Wood, Dursley, **G**, MARK & CK. Also small patch by the River Trym, Coombe Dingle, **G**, LH, MARK & CK.

Anisantha madritensis (L.) Nevski **Compact Brome**. Single plant on north verge of A369, St George's Hill, Easton-in-Gordano, **S**, IPG. Also thousands of plants on north verge of M5 between Clevedon and Portbury, **S**, IPG.

A. diandra (Roth) Tutin ex Tzvelev **Great Brome**. Several plants at foot of wall, Buckland Dinham, **S**, IPG.

Ceratochloa carinata (Hook. & Arn.) Tutin **California Brome**. By the River Avon at St Philips, Bristol, **G**, RJH. Believed to be the first record for v.c. 34.

C. cathartica (Vahl) Herter **Rescue Brome**. Several specimens on north verge of Top Road, Westbury-sub-Mendip, **S**, IPG & PRG. Also by the River Avon, Bath, RJH. Specimen in Herb. I.P. Green.
Setaria viridis (L.) P. Beauv. **Green Bristle-grass**. One plant in garden, Rodney Stoke, **S**, Mrs A. Cole. A few plants on stonework, and also *S. pumila* (Poir.) Schult. **Yellow Bristle-grass**, Cheddar Reservoir, **S**, IPG & AS.
Panicum miliaceum L. **Common Millet**. Plentiful, as also *Phalaris canariensis* L. **Canary-grass**, on stonework of Cheddar Reservoir, **S**, IPG & AS. A few plants also of *Panicum capillare* L. **Witch-grass**, *Echinochloa crus-galli* (L.) P. Beauv. **Cockspur** and *Triticum aestivum* L. **Bread Wheat**, IPG & AS.

Millet

Professor A.J. Willis
Dept of Animal and Plant Sciences, The University, Sheffield, S10 2TN

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The wood engravings are from '*Illustrations of the British Flora*' by W.H. Fitch and W.G. Smith (1897) L. Reeve & Co. London. The Editor is grateful to Marilyn Ward, Illustrations Curator, Royal Botanic Gardens, Kew, for help in establishing ownership of these figures.

The older illustrations are taken from 'A Complete Herbal' by James Newton M.D. ('with illustrations curiously engraved on 176 copper-plates') dated 1802. This book is one of several similar, to be found in the Library of the Bristol Naturalists' Society. The abbreviation 'G' and 'P' after the common names refer to the lists given in the herbals of Gerard and Perkinson respectively.

'As for the antique Spelling, it is to be hoped the Reader will excufe that, fince there's no Poffibility of altering it' sic. - a quotation from the above book.

Terry Smith Editor

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TREE GAZING AROUND BRISTOL
THE TOP TEN TREE HYBRIDS

Tony Titchen
President, Botanical Section, BNS

Reviewing the origins of ten widely planted trees of the Bristol area.

Introduction

Hybrid trees arise from the cross-fertilisation of two closely related species which are usually prevented from interbreeding either because of their geographical isolation or because they flower in different seasons. The progeny of the hybridisation, known as the F1 generation are often notably more vigorous and grow to a larger size than either parent. Some hybrid trees are themselves fertile, but their progeny lack the vigour of their parents, and if vigour is to be sustained, the hybrids have to be propagated vegetatively. This article reviews the origins of ten of the hybrids that are widely planted as amenity trees in the Bristol area. Many of the trees have still not attained their ultimate size and it is expected that they may grow to a very large size. A good example of a hybrid tree is the Leyland Cypress.

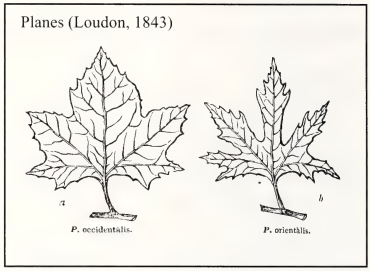
1) *Platanus* x *hispanica* **The London Plane**

This is the largest of the hybrids. It was calculated that in London in 1925 over 60% of trees lining the streets were London Planes as it was well adapted to the pollution produced by burning coal in open hearths. Its large leaves and the fact that the bark is shed by exfoliation from the trunk and branches make it supremely adapted to smog, and now, car fumes. The bark contains breathing pores and when these become blocked, it simply sloughs the pieces off and grows some more. The large leaves can be washed clean by the rain.

In Bristol a smaller percentage of our street trees are London Plane. Some of the double row around Queens Square are over 120 years old; others are planted along Redland Road and Whiteladies Road. There are also many newly planted trees on industrial estates and car parks. The tree can be pollarded easily and will readily send out new shoots.

The oldest London Planes in Bristol are on the Stoke Park Estate, originally owned by Sir Richard Berkeley and now part of the Purdown ridge, visible from the M32 motorway on the right when approaching Bristol. Five enormous trees planted in about 1760 exist well hidden in an area of Hermitage Wood known as

'The Long Saloon'. These have girths of over 7.5m. Up one of them grows an ivy with a girth of 80cm. These trees are far larger than the excellent specimen in Bath at The Circus and St James Square that were planted in 1795.



It is now generally thought that the London Plane is a hybrid between two species of *Platanus: P. orientalis* the southern European Oriental Plane or Chennor tree and the North American *P. occidentalis* the Buttonwood or American Sycamore. The former can be seen outside Amberley House School, Clifton, in the grounds of Leigh Court, and in Royal Fort Gardens at the University. *P. occidentalis* is very scarce and is much less hardy, but there are several young trees at Westonbirt Arboretum, and in a Clifton churchyard. Both trees were offered for sale by Millers and Sweet in Bristol in the very early nineteenth century, but it is now considered that the *P. occidentalis* on offer then was really a variant of the London Plane and not the North American species.

The Buttonwood has just one female inflorescence ball which has soft residual spines, and small shallowly lobed leaves, whilst the Oriental Plane has clusters of 3 to 7 female inflorescences with spiny residual styles, and deeply cut large palmate leaves. Both species of tree are very long-lived and grow to enormous girth in their native habitats. Many stories exist of massive Oriental Plane trees in Greece and southern Europe, living for up to 3000 years in exceptional cases. Girths of over 9m and heights of over 36m have been recorded. Visitors to Crete will know the massive tree with a 10m girth at Krasi and possibly the two even bigger trees at Therisso that have a girth of 11m. Corsham Court, Wiltshire has a specimen sprawling over a very large area, layering itself and spreading. In North America Buttonwood will grow to a height of 51m with a girth of 9m. It occurs in various forms from Texas to Maine, where it is known as the most massive and possibly the tallest deciduous tree of eastern North America. The old woods of Ohio were famous for their 'Big Trees'.

Thus both parents of the London Plane are giants. It is a fertile hybrid and seed sown from it will give a large variation between the two parents. Some will tend to be massive and squat, like the American species, whilst others will tend towards the spreading and faster growing south European species. If, in the wild, the parents will grow to over 45m, the F1 generation may grow half as tall

again to 68m. What a wonderful place Bristol is going to be in two to three hundred years with Plane trees lining the streets over 60m high and 10m in girth. There will of course be no room for the cars!

The Plane Tree (Johns, 1889)

The oldest known British specimens of London Plane were planted in the Bishop's Palace at Ely and at Ranelagh Park, Chelsea, before 1685. The tallest specimen is one of five planted in 1740 near Bryanston School, Blandford Forum, now measuring about 48m tall after 250 years. Lydney Park, in Gloucestershire, has a tree 33m tall with a straight bole of 4.5m before it branches.

Some believe that the London Plane is not a hybrid but simply a genetic variant of the South European Plane, which arose in Spain. This is supported by the fact that in Tenerife, a Spanish territory, the streets are lined with trees they call 'London Plane' but which have leaves that are half the size of ours, a natural variant of the true species selected for the Canary Island climate. A recent book by Stephen A. Spongberg '*A Reunion of Trees*' mentions that John Tradescant the younger imported seed and cuttings of the Buttonwood from North America in 1637. He was also growing the European species, so that the hybridisation between them may have happened by accident. However the cold winters of the 17th century might imply that hybridisation would have been more likely if the American species grew in Spain. Loudon, writing in 1843, does not mention hybrids between the two species, although both the Oriental and American Plane were in cultivation. He does however give a form of the Oriental Plane the name 'Spanish Maple'. It seems likely that through all of the 18th century and early 19th century botanists were ignorant of the existence of a hybrid London Plane. Loudon goes on to say that "the general practise is to sow the seeds (Oriental Plane) in autumn, as soon as gathered or received from the continent, for them to germinate in the autumn." This lends support to the possibility that the London Plane is here as an accidental hybridisation from the past and not as a deliberate cross. An influential book of the Victorian era 'The Forest Trees of Britain' by the Reverend C.A. Johns, 1889, also has no mention of the London Plane or the fact that a hybrid tree exists.

The London Plane is fertile and the resulting F2 generation produces very variable plants. Early nurserymen knew this and normally propagated

vegetatively by cuttings or by layering, using coppiced stools in the nursery. This created a variety of clones, some close to the European species with 5 or 6 female balls; others more like the American species with only one or two.

Some Bristol streets particularly in Redland, have been planted with an upright pyramidal form of the London Plane, usually grafted at the base on to 'normal' London Plane stock. This is var. *pyramidalis*, which arose as a sport in 1850. The lower branches assume an erect position, and these are often removed to encourage the tree to form a vase-like shape. The leaves of this form are large and shiny, and usually have only three shallow lobes rather than five. Two or three female inflorescences develop, but usually by late summer, only one has developed to a large golf ball size. Sometimes these are not grafted and have their own roots. Several exist in Castle Park, Bristol, near to the Strawberry Tree and the famous Lebanon Oak.

The Bath Botanic Garden has var. *suttnori* growing against the north fence. This striking form, whose large leaves are boldly variegated creamy white, occurred in 1860 as a seedling genetic variant and has been propagated vegetatively ever since.

2) x *Cupressocyparis leylandii* **Leyland Cypress**

Hillier states that the first hybrid trees occurred in Rostrevor, Co. Down, Ireland, about 1870, where the two parents, *Cupressus macrocarpa* Monterey Cypress (seed parent) and *Chamaecyparis nootkatensis* Nootka Cypress (pollen parent) grew close together. Both plants were introduced from the west coast of North America. The Monterey Cypress was introduced in 1838 whilst the Nootka, growing further north, was introduced as late as 1853, only 17 years before the first hybridisation. In 1888, at Leighton Hall near Welshpool, Powys, both parents were again growing close together. Seed was sown from the Monterey Cypress with the Nootka once again as the pollen parent. Six seedlings arose and these were described as clones 1 to 6. Clone 1 was named: 'Green Spire' It forms a dense, narrow column of bright green foliage with irregular sprays. As it ages, it grows closer to clone 2, which was called 'Haggerston Grey'. This has a pale grey colour although the foliage is green, with dense irregular sprays, and is very common in cultivation.

The original trees of clones 3 to 6 apparently still grow at Leighton Hall. However, in 1911 the cross recurred at Leighton Hall. This time the Nootka Cypress was the mother, providing seed, and the Monterey was the pollen parent. Two seedlings arose from this union; 'Naylor's Blue' (clone 10) which is a narrow columnar tree with grey-green foliage, glaucous in the winter, and

'Leighton Green' (clone 11), which is very common in cultivation and is still growing behind Leighton House. In 1988 this tree was 33m high and had a girth of 5.4m after 77 years.

In 1940 in a Dorset garden at Ferndown, two seedlings were raised, known as clone 20 and clone 21. They were given the names 'Stapehill', which is a dense columnar tree with more or less flattened sprays of green foliage, and 'Ferndown'. A number of later sports arose of which 'Silver Dust' appeared in 1960 from Washington D.C.

Subsequently a number of new hybrids were deliberately raised. 'Castlewellan Gold' grows more slowly than 'Leighton Green' and is better for hedges. Its parents were *Cupressus macrocarpa* v *lutea* (Golden Monterey Cypress) and *Chamaecyparis nootkatensis* v *lutea*, a golden form of the Nootka Cypress. An Irish synonym for this is 'Galway Gold'. 'Castlewellan Gold' was one of two seedlings selected by John Keown who registered one as *Cupressus macrocarpa* 'Keownii' 1963, not as a form of x *C. leylandii*. However he knew that the Golden Nootka was nearby. Mitchell (1996), details 'horticultural thieving', saying that the tree was hidden from view as it was to be registered under the Plants Variety Rights Act. Raiders broke into the Arboretum and took many golden tip-cuttings. These turned up registered as 'Galway Gold', 'Mellow Yellow' and other names. He records the original 'Castlewellan Gold' tree in 1995 as being 13m high with a girth of over 3m.

'Robinson's Gold' was raised at Belvoir Castle Park, Cork, as a seedling sport in 1962, and is a very popular plant in Ireland. Mr Robinson, a gardener, planted the seed and selected the more golden tree, which is bronze-yellow in spring and later golden yellow. A complete 'set' of all *Leylandii* cultivars can be seen at the National Pinetum, Bedgebury, Kent.

Originally the trees were considered to be varieties of Monterey Cypress. However in 1925, an American botanist staying at Leighton Hall prior to attending a conifer conference found the clone 11 'Leighton Green' and was unable to name it. He took the foliage to the conifer conference and showed it to Dallimore, the world expert on conifers from Kew. He recognised it as a hybrid in 1926, and published the name '*Cupressus* x *leylandii*' in conjunction with Jackson in the Kew bulletin

Five different types, including the Dorset form, occur as separate plantings on the University Campus, Claverton Down, Bath. Westonbirt has many good examples and all the big ones are direct from Leighton Hall.

x *Cupressocyparis leylandii* can be recognised by its erect leader. Whereas Lawson Cypress and the majority of its cultivars have drooping leaders, both Monterey and Nootka Cypress have erect leaders. This is passed on to the hybrid. All leaders, both main and lateral, are erect. The foliage and cones of the hybrid are always closer to the original mother plant type. Cones on Monterey Cypress are 2.5cm to 3.5cm across. Clones with the Monterey as seed parent have cones 1.5cm to 2cm across. These are 'Haggerston Grey', 'Green Spire', 'Castlewellan Gold', 'Rostrevor'. The Nootka Cypress has cones 1cm across with a characteristic hook on the scales. Clones have cones that are only slightly larger with a small hook on the scale. These are 'Leighton Green', 'Naylor's Blue' and 'Silver Dust'. The foliage from a Nootka parent seed will have flatter sprays than that from a Monterey, which will be very much more irregular.

3) *Aesculus* x *carnea* **Red Horse Chestnut**

In the 17th and 18th centuries Britain was exporting European Horse Chestnuts, *Aesculus hippocastanum*, to the USA, but from 1711 there were imports of a shrubby tree, *A. pavia* Red Buck-eye. This tree can be seen near the entrance to 'The Holmes', a University property opposite Churchill Hall at the top of Stoke Hill. It has bright red flowers, a shrubby habit and odd-shaped smooth fruits in the autumn. It is native to Virginia and Kentucky.

It is now generally agreed that insects, rather than men, allowed cross-pollination between the two species. The parents are very different species, so it is unusual for them to be sexually compatible, but they are the same genus and do have similar chromosome numbers. No records exist as to whether the Red Horse Chestnut was first discovered in the USA or in Europe. However it is agreed that the Red Horse Chestnut was first recognised as being different from the Horse Chestnut in about 1820. Loudon was uncertain whether it was a native plant in the USA or whether it had originated in British gardens. Bean suggests that the original plant must have grown to maturity with no horticultural knowledge of its existence. This means that somewhere a chestnut germinated after cross-pollination to produce a 'red' chestnut rather than white, and from this the rest were propagated vegetatively or by seed. Once it had been discovered, the plant was grafted on to stocks of *A. hippocastanum*. This would have occurred through most of the 19th century as horticultural practice and suggests the origin of the mature grafted specimens on Durdham Down that are well over 100 years old.

Kew Gardens germinated six seeds from one Red Horse Chestnut tree in 1896 and found that the resulting progeny were all the same. One of the premises for the hybrid origin fertile trees is that the resulting progeny have a large variation

in their form. It may be that the original *Aesculus* x *carnea*, was diploid with forty chromosomes, similar to each of the parents. It is known that this was sterile, hence the reason for the grafting on to Horse Chestnut stocks. Geneticists suggest that at sometime in one of the early plants a spontaneous doubling of the chromosomes occurred. This would enable sexual reproduction to occur with no variation in the progeny, and the plant would be acting like a true species. F2 *Aesculus* x *carnea* plants are always smaller trees than the grafted type, and are the standard modern type. Bean suggests that if the doubling of chromosomes occurred in the original parent, possibly caused by the continual taking of cuttings and damaging of tissues, then part of the original tree may have been diploid and part tetraploid. The diploid would be sterile and the tetraploid fertile. Obviously the Kew trees were from a tetraploid branch.

Hillier describes the Red Horse Chestnut as "a large tree, much used for avenues and parks. Flowers rose pink in panicles up to 20cm long. Similar to the Horse Chestnut, *A hippocastanum,* but smaller and more compact with smaller, darker green leaflets." An important difference is that the fruit is very prickly in *A. hippocastanum*, but only slightly rugose and bumpy in *A.* x *carnea*. Also the leaflets have a slight stalk, whereas the leaflets of the Horse Chestnut have none. The difference in height is noticeable in trees on the Downs where they are usually grafted at a height of about 1.5m on stock of Horse Chestnut. On trees with a girth of more than 1.20m, the trunk above the graft often appears to be diseased and covered with ugly eruptions that ultimately decay and disintegrate into a powder. No organism (fungal, animal or parasite) appears to be present, and it seems to be an abnormal development of cells that subsequently die.

There are two varieties of Red Horse Chestnut, '*Aureo-marginalis'* whose leaves are margined yellow, and '*Folio-marginalis'* with a pale green leaf centre, a band of gold and a green edge to the leaf. These have to be vegetatively propagated.

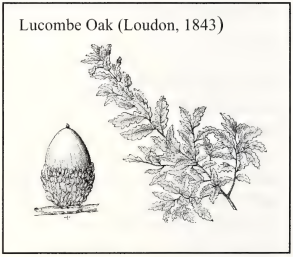
The cross between *Aesculus* x *carnea* and *A. hippocastanum* produces a triploid plant known as *A.* x *carnea 'Plantierensis*' (Pink Horse Chestnut). This hybrid was raised in France with the Horse Chestnut as the mother. Its overall size is three quarters of a mature Horse Chestnut, the flower is a nice shade of pink and the plant is sterile. A very spiny seed case is developed but the seeds are atrophied. There is a specimen in Royal Victoria Park, Bath. Another variety from France is *Aesculus hippocastanum* var. *'Baumannii'.* This has double whitish pink flowers, is grafted and produces no conkers. There is a specimen on Durdham Down at the top of Stoke Hill opposite the mobile cafe by the coach lay-by.

The cross between *Aesculus* x *carnea* and *A. pavia* Red Buck-eye produces a sterile triploid plant which is a neat small round-topped tree with bright red flowers. It can be seen in Clifton and at University properties around Bristol, and is called *Aesculus* x *carnea 'Briotii'* and once again is French. *A. hippocastanum* can be crossed with the American Yellow Buck-eye, *A. flava*, to make a rare graft chimera *A.* x *Dallimoorii*. *A. pavia*, the American Red Buck-eye, will hybridise freely with its fellow American Yellow Buck-eye to produce an interesting hybrid, *A.* x *hybrida,* which can be seen in the grounds of Blackberry Hill Hospital, Fishponds. There was once a specimen of the Yellow Horse Chestnut *Aesculus flava*, grafted on to a Horse Chestnut in the Royal Fort Gardens.

4) *Quercus* x *hispanica* **The Lucombe Oak**

This hybrid has had a number of names in the past reflecting the fact that it has arisen several times in different locations. It is a hybrid between the Turkey Oak *(Q. cerris*) and the Cork Oak (*Q. suber*). In the wild in Southern Europe, where both parents grow, the mother plant is considered to be the Cork Oak, giving rise to the *Q. pseudosuber* range of forms. The bark is definitely corky, over 2.5cm thick and the tree is always evergreen. In nurseries the mother tree is the Turkey Oak, and the offspring may not always have a corky bark and may also shed all their leaves in winter.

Whichever species is the mother or father, the resulting plant will always have hybrid vigour and be very fertile. The acorns, when sown produce a wide variation of form, from the corky bark and evergreen leaves of the Cork Oak to the characteristic dark ridged bark and deciduous leaves of the Turkey Oak. Two characteristics do help the botanist. The whiskery stipules on the main leader buds and the mossy character of the cupule surrounding the base of the acorn are characteristics inherited from the Turkey Oak and are not present in the Cork Oak.


Lucombe Oak (Loudon, 1843)

Loudon refers to the Lucombe Oak as the Exeter Oak or Devon Oak, which he regarded as a variety of *Q. cerris*. Henry and Elwes introduced the concept of the southern European wild form *Q. pseudosuber* as well as expanding on the cultivated type. The modern name *Q.* x *hispanica* was given by Lamarck who described a tree growing in France at the famous Trianon gardens in 1783. He

was told it came from Gibraltar, but this cannot be correct as reference to Flora Europea quite categorically states that the Turkey Oak is not found on the Iberian Peninsula.

Mitchell argues that the tree should be renamed *Q.* x *lucombeana* after a tree grafted by Mr Lucombe senior. This cultivar is found in great numbers around Exeter and surrounding estates, and is described in detail by Mitchell. In the Bristol region I only know one tree that fits the description, which is in the Royal Fort Gardens. Here the tree is magnificent but it is grafted on to English Oak not Turkey Oak. This tree may be a second generation graft taken from an original *Q.* x *lucombeana* 'William Lucombe'. I suspect that the Bristol nurserymen, Millers and Sweet, now Garraways in Whiteladies Road, would have sold this tree to the Tyndalls. Their 1803 catalogue clearly mentions 'Mr Lucombe's Oak' and they could have done their own grafts on to what for them, was a common stock available locally in Leigh Woods, *Q. robur*.

Mr Lucombe started a nursery in Exeter in partnership with Mr Pince in 1720. They specialised in exotic trees, shrubs and plants and grew as many of the new introductions from N. America and Europe as they could. In 1735 he introduced the Turkey Oak into cultivation but there is no mention of the source of his seeds. It would be interesting to know if they came from the wild or whether he was given some by a continental nurseryman. The name 'Turkey Oak' refers to the fact that the tree grows wild in what was the old Ottoman Empire, controlled by the Turks. The subsequent demise of the empire means that only a sub-species of *Q. cerris* occurs in what we now know as Turkey, so it is most likely his original seed came from S.E. France. In 1765 he sowed many acorns taken from the tree he called the Iron or Wainscot Oak (*Q. cerris*) that grew in his nursery. He observed that one of these seedlings was very vigorous and did not lose its leaves in winter. Records show that he took many thousands of scions from it and grafted them easily on to the young seedlings of *Q. cerris*. It was obviously a very successful product that made them a lot of money.

In about 1786, 66 years after he started the business, Mr Lucombe had the 20-year-old original seedling tree cut down. It was known to be only 90cm in circumference. He decided that, because he was of 'advanced years', he would make for himself a coffin out of the tree that had provided him so much money. The sapling tree was cut into planks that he stored under his bed until they were needed to construct his coffin. However, even the best plans can go wrong. He lived to be 102, by which time the planks had warped and were unusable. So his coffin was made of one of the original 'William Lucombe' grafted trees.

In around 1790 the nursery also planted acorns from the grafted 'William

Lucombes' and many very variable seedlings were raised. Three were selected and propagated at the Exeter nursery by grafting on to *Q. cerris*. None of these first three types or two later ones selected in 1830 were vigorous because they were either F2 or F3 plants. They all had very corky bark and kept their leaves till late in the season. The drooping branchlets and the mucronate points on the teeth of the leaf lobes are similar to the F1 'William Lucombe', but the shape of the leaves and the characteristics of the acorn and cupule differ and separate these trees from the original 'William Lucombe'. Trees from the Exeter nursery can be found at Leigh Court, and Stoke Lodge. They have short trunks, spreading limbs and an obvious graft on to Turkey Oak.

In the early 19th century Whitby and Osborn's Nursery at Fulham, London, propagated the 'Fulham Oak' which has a very corky bark and was obviously procured from Lucombes in Exeter and selected for its corky appearance. Original Fulham Oaks are grafted on to *Q. robur*. I believe the trees on the Downs by Litfield Place, Clifton, the tree in the Woodland Garden of Paradise Bottom, Leigh Court, and the one tree remaining in Victoria Square, Clifton to be this or the closely related var. '*fulhamensis latifolia*'. This has a broad leaf, with rounded teeth, is grey tomentose beneath and seven or eight lateral veins on the leaf. Reference trees of this type can be seen at Westonbirt Arboretum and Abbotsbury in Dorset. (Also see colour plate).

5) *Magnolia* x *soulangiana* **Saucer Magnolia**

The Saucer Magnolia is a hybrid between two Chinese Magnolia species introduced in the 18th century. The hybrid arose in the grounds of Chevalier Etienne Soulange-Bodin's Chateau at Fromont outside Paris. He had recently returned to his home following the Napoleonic Wars. Quite by accident, two Chinese introductions were growing together in 1826. They were *Magnolia denudata* The Yulan or Lily Tree, which flowers in early spring and can be seen in the University Botanic Garden. It has a lovely fragrant pure white cup-shaped flower and was introduced about 1789 by Sir Joseph Banks to Britain from Japan. It has nine tepals and a lemony scent and will flower from February to April. In Japan the plant is grown so that the tepals can be eaten. They are dipped in flour and fried in oil until crisp. The bark is used as a cure for the common cold. The second tree was *Magnolia liliiflora* the 'Purple Magnolia', which has an erect slim flower, a flush of purple on the outside and

Magnolia (Loudon, 1843)

43. Magnòlia conspicua Soulangeana.

creamy colour on the inside, with six tepals. A superb specimen can be seen at the bottom of Rownham Hill outside the mounted police premises. It flowers later than *M. denudata*, and as a result the hybrid flowers into late May.

After he had successfully crossed The Yulan and the Purple Magnolia, Chevalier Soulange-Bodin wrote for the transactions of the Linnean Society of Paris in 1827: "By the crossing of a Magnolia Yulan (*M. denudata*) grown from seed, with the pollen of *M. discolor* (*M. liliiflora*), the Fromont Gardens witnessed the birth, growth and establishment amongst the varied specimens to be admired there of a hybrid, which is remarkable for its tree like habit, handsome foliage, and above all for its spreading brilliant flowers, in the purest white tinged with a purplish hue. My worthy colleagues named this beautiful species *Magnolia soulangeana*."

When Monsieur Soulange-Bodin sowed his seeds, many seedlings germinated. The first one to flower was described in 1827 but others flowered in later years and eight plants were selected to be the hybrids of the future. This work was done in conjunction with the Cels Nursery at Mont Rouge in the 1830s. It is possible that Monsieur Cels senior, who died in 1806, was instrumental in bringing the plants from China in the late 18th century, although this has not been confirmed. It is thought that he visited China at about the right time. It is known that Soulange-Bodin with Cels produced the varieties 'Alexandrina', 'Norbertii', 'Speciosa' and 'Alba Superba'.

It was not long after 1828 that the hybrid was introduced into the UK via Young's Nursery at Epsom, Surrey. Not everybody treated it as a new hybrid. Loudon was undecided, and Elwes and Henry treated it as a variety *of M. denudata*. The Chinese had more than a thousand years experience of growing their flora in their gardens and temples so it is possible that both of the original 'species' brought out of China could themselves have been hybrids, raised by the Chinese gardeners over the centuries. The colour variations in *M. liliiflora* suggest a hybrid origin.

Magnolia liliiflora 'Nigra' was not introduced into cultivation until 1861, by John Gould Veitch, grandson of the famous founder of the nursery Veitch & Sons. It came from a Japanese nursery, soon after Japan opened up its ports for trade. This variety has been hybridised with The Yulan to produce the popular cultivar 'Picture'. An early variety produced from this mid-19th century plant and The Yulan was the popular 'Lennei', with large goblets, flowers with rose-purple tepals on the outside, cream on the inside. 'Rustica Rubra' another popular variety, is a seedling from 'Lennei'. 'Lennei Alba' also arose from a 'Lennei' seed, showing the white Yulan parent in its make up. The most

common white forms 'Alexandrina', and 'Alba Superba' are from the 1830 hybrids. Good specimens occur at Westonbirt Arboretum and Bath Botanic Gardens.

The process of hybridisation has continued. In the mid-1950s Dr Tod Gresham produced a range of exciting varieties. (a) Svelte Brunettes. *M* x *veitchii* x *M. liliiflora*. of which the most popular cultivar is 'Peppermint Stick', and (b) Buxom Nordic Blondes. *M.* x *veitchii* x *M.* x *soulangeana* 'Lennei Alba', of which the most popular cultivar is 'Sayonora'. Good specimens of both of these can be seen at Knightshayes.

The American hybridiser De Vos produced a range of hybrids from 1965, which are known as the Kosar hybrids. In this group of hybrids the pollen of *M. stellata* 'Rosca' is added to *M. liliiflora* 'Nigra'. The resulting varieties all have girls' names, Anne, Betty, Judy, Randy, Ricky and Susan.

6) *Ilex* x *altaclarensis* **Highclere Hollies**

In 1838, J. C. Loudon first described a common holly growing at Highclere Castle, Newbury, Berks, the estate of the Earls of Carnarvon. It is listed as *Ilex aquifolium* 'Altaclarensis' after the mediaeval Latin name for the castle. Loudon recognised that the 'Altaclarensis' arose through horticultural means. He described this Holly as having leaves that are broad, thin and flat. It must have originated from berries sown from Madeiran Hollies (*Ilex perado*) that had been introduced in 1760 and kept in large conservatories during winter and frequently wheeled out in large tubs between May and September. They are large ornamental trees with broad flat spineless leaves. Whilst they were in the open, cross-pollination took place from surrounding English Hollies (*Ilex aquifolium*). The resulting berries on the Madeiran plants were collected and sown, and several hybrid progeny were produced. The first seedlings were easily vegetatively propagated, usually by grafting on to English Holly rootstocks. Many of these occur in Clifton, Bristol.

The first hybrids were distributed in the early 19th century from the famous arboreta at Chiswick and Hackney, owned by Loddiges, the nurserymen, although they named them *Ilex aquifolium* 'Altaclarensis'. During the middle of the 19th century nurserymen experimented with other Hollies from the Macaronesian Islands including the Canary Island Holly from the laurel forests of Tenerife and La Gomera (*Ilex perado* ssp. *platyphylla*). As a result the term Highclere Holly refers to a wide variety of crosses and back-crosses.

English Hollies usually have a narrow leaf, frequently with spines that point in

all directions with leaves often buckled and undulating. The leaves do not have a winged stalk and the berries are small. Hillier lists sixty varieties. The Highclere Hollies have 20 listed varieties. They generally have broad, flat leaves, non-undulating, with few, if any, spines. Leaves may have winged stalks and the berries are large and bright coloured. Susyn Andrews who is an expert on Hollies and works at the Royal Botanic Garden, Kew, has divided the Altaclarensis hybrid clones into six groups:

a.) 'Balearic'. A female clone, with leaves green, ovate to elliptic, 7-9cm long, not variegated, margins entire or spiny. The young stems are green, olive green to purplish on upper surface. It has many large fruits and is a vigorous tree with upright branches. It is scarce in the Bristol area.

b.) 'Belgica'. A female clone with leaves that are green/variegated, lanceolate, elliptic lanceolate to elliptic oblong, margins entire or spiny. Young stems are green to yellow green. There are some in Clifton.

c.) 'Camelliifolia'. A female clone, whose leaves are green/variegated, elliptic to elliptic/oblong 9-13cm, margins entire, very few spines, flat or twisted (not buckled). Young stems and petioles are purplish. They can be found in Clifton.

d.) 'Hendersonii'. A female clone with dull green leaves, that may be variegated, usually oblong ovate 9-11cm long, margins entire, very few spines. Young stems and petioles are green. 'Hendersonii', and forms 'Golden King' and 'Lawsoniana' are all common in the Bristol/Clifton area.

e.) 'Hodginsii'. This is a male form with leaves green, variegated, ovate to ovate oblong, margins entire to spiny 8-12cm long. The stems are green to green/purple/black. 'Hodginsii', and 'Shepherdii' are common in Bristol and Clifton, and some are very large.

f.)'Maderensis'. A male form with leaves that are green, broadly ovate to elliptic, not variegated. 9-11cm long, with margins entire or spiny. The stems are green to purple above. It is rare.

7) *Ulmus* x *hollandica* 'Vegeta' **Huntingdon Elm**

The parents are *U. glabra*, the native Wych Elm in its subspecies glabra from Southern England, and *U. minor* ssp. *Minor,* also native. As both parents are native to Britain, this vigorous hybrid has occurred many times in the British Isles and also in Europe where the same species occur. Hillier lists a dozen varieties. Many are Dutch in origin and have been found to be Dutch Elm

Disease resistant. One is the attractive and very upright '*Dampieri Aurea*', or as it is sometimes called '*Wredei Aurea*', which is wholly yellow in its leaves throughout the year and is proving very successful as a park tree.

The variety '*Vegeta*', known as the 'Huntingdon Elm' or 'Chichester Elm' was first raised from seed taken from trees in Hinchingbrook Park, Cambridgeshire in about 1750. Loudon records that he received a letter from a Mr. John Wood, a nurseryman near Huntingdon, in November 1836 saying "The Huntingdon Elm was raised here about 80 or 90 years ago (1746-1756), by an uncle of mine, from seed collected in this neighbourhood. I have sent many plants of it all over the country and it has been given out from Norwich, Bristol and other places under the name of the Chichester Elm; but you may rely on my word that the Chichester Elm and Huntingdon Elm are one and the same thing. The tree is the fastest grower, and produces the best timber of all the Elms".

Hillier's description of the tree is excellent. "A magnificent large tree with a short trunk and long ascending branches. Young shoots sparse, v hairy. Leaves large, elliptic and very unequal at the base, long pointed, smooth dark green and shining above, jaggedly toothed and conspicuously veined". To this I would add that the leaf stalk is green/yellow and that the large leaves have their margin arising from a lower vein in the leaf rather than from mid-rib. They flower in February and are in fruit March-April. Also, mature specimens have a semi-pendulous habit to the base of the crown, enabling leaves, flowers and fruit to be inspected easily. The bark is heavily fissured.

One of these superb trees can be seen on Durdham Downs beside Upper Belgrave Road. It stands out as a magnificent specimen. There were three, until December 2000, when two were felled because they had finally succumbed to Dutch Elm Disease. At the Bridge Valley Road end of Ladies Mile is another specimen and there are a couple of others to be seen on the Downs. These few elms managed to survive the ravages of the 1976 outbreak that removed from the Downs the avenues of '*Vegeta*' that had been planted in the 1890s.

Silkwood Broad Drive in Westonbirt Arboretum has a magnificent specimen, which is the Champion of the British Isles and was measured in 1988 as 32 metres high and 3.52m in girth. It was planted about 1895. There is another fine specimen by Westonbirt house.

8) *Larix* x *eurolepis* **Dunkeld or Hybrid Larch**

Larix x *eurolepis* is a hybrid between *Larix decidua*, the European Larch, and *Larix kaempferi*, the Japanese Larch. The latter was introduced to this country

as early as 1861 by John Gould Veitch after one of the Veitch family's plant collecting expeditions. The Japanese Larch is vigorous with reddish shoots. It has 2-3cm long ovoid cones with reflexed scales turned outward and downward. Its leaves are broader than *L. decidua* and trees always have a heavy crop of cones. During the 20th century *L. kaempferi* gradually replaced the European Larch in plantations in Scotland. Mature trees do not have the hanging curtains of shoots that are a feature of the European Larch.

The Dunkeld Larch is intermediate between the two parents and is not so likely to become diseased as the European Larch. It is also very vigorous. In 1884-85 the Duke of Atholl planted eleven Japanese Larches below Kennel Bank at Dunkeld House, Perthshire. He wanted to gather seed from them and to plant more. He also planted one on its own, surrounded by European Larch with the objective of producing hybrid seed. Seedlings from the eleven trees were planted near Dunkeld Cathedral (Bishop's Walk) in 1897. It was noticed in 1904 that some of the plants were exceptionally vigorous with paler shoots than the Japanese parents, although they were not as pale as the European Larch.

Some of these trees were moved to Blair Castle where they were immediately recognised as hybrids. Hybrid vigour only occurs in the first generation, so for a long time these first eleven trees were the only source of vigorous hybrid seedlings. The Forestry Commission now has special plots producing first generation seed. The seminal parent is to the best of my knowledge, always the Japanese Larch.

Dunkeld Larches can be seen on Forestry Commission land in Leigh Woods, Bristol and on other Forestry Commission sites in the area.

9) *Tilia* x *europaea* **Common Lime**

This hybrid is either *Tilia cordata* x *Tilia platyphyllos* or *Tilia platyphyllos* x *Tilia cordata*. It is usual to show the seminal (mother) parent as the first name when writing down the parents of a hybrid. I suspect that both crosses have occurred, although the later flowering period of The Common Lime, early July, is closest to that of the Small-leaved Lime, *T. cordata*, July, rather than the Broad-leaved Lime, *T. platyphyllos* in June, so the first cross is the more likely one.

According to Stace, the hybrid does occur in the wild where both parents grow together and that the resulting hybrid is partially fertile. This natural hybrid occurs at Symonds Yat on the River Wye. Both parent species occur in Leigh Woods, where the Small-leaved Lime is fairly abundant and flowers copiously,

but the Broad-leaved Lime is very rare with only a few wild individuals and one enormous tree that may have been planted near the Rangers Cottages. White in the Bristol Flora (1912) makes no mention of the Broad-leaved Lime occurring in the Bristol district. Instead the reader is referred to the avenue of limes in Stoke Park Road near the Downs, which at the time was the SE boundary of Stoke House. This avenue still exists (see colour plate). Stoke House has been replaced by Churchill Hall, which is surrounded by an excellent arboretum. White uses the name *T. europaea* L. It is not clear whether he realised that the Common Lime was a hybrid.

Mitchell considers it may have had one of three possible origins. Firstly it could have arisen in Europe where both parents are common wild trees. A few very large specimens still occur in Europe. The Common Lime may have migrated, as its parents did, into the UK after the last Ice Age and colonised the South of England. However this is unlikely, as the Common Lime rarely seeds, although the parents produce abundant viable seed.

Secondly it could have arisen, as it has in the Wye Valley, by cross-pollination following visitation of both parents by bees searching for the copious nectar. Normally such a crossing would be prevented because the Broad-leaved Lime flowers earlier than the Small-leaved Lime, but, as it has happened many times in Central Europe, it is clearly possible. The French know the trees as 'Grands Tilleuls' as they display hybrid vigour.

The Common Lime (Loudon, 1849)

Thirdly it may have been introduced into Britain in the early 17th Century. Mitchell suggests that the oldest plantings in the UK in about 1600-1620 are an avenue of limes at Hawkstead in Suffolk, followed by trees planted in 1660 at Ashridge Park in Hertfordshire. In Bristol the avenue at Kingsweston House, Shirehampton, overlooking the Channel is probably mid-18th Century, and at Dyrham Park (NT) in the Deer Park on the hill, there are trees known to have been planted in 1700. The trees around the base of the castle at Blaise are probably late 18th century.

The accession of William III in 1688 introduced the fashion for lime avenues that were in vogue at the time in Holland. Nurserymen used material propagated from the epicormic shoots of natural hybrids found in Europe.

In 1988, Professor Donald Piggott noted that, although the parents hybridise naturally, the hybrid has never been artificially reproduced. Because both parent species are variable there is much variation among the natural hybrids, which have been cloned by extensive vegetative propagation. He suggested that before 1750 two distinct clones were being propagated.

The first has distinctive buttresses at the base of the tree. When young, this clone has a cylindrical bole and is smooth barked. Epicormic shoots sprout in clumps from the lower part of the bole and also extend high up into the lower part of the crown. Young shoots on this clone are red- twigged. The main axis, which may be single-stemmed or with two to three vertical limbs, has a paraboloid form with an erect arrangement of branches. The tree flowers profusely and is a favourite with bees. Each inflorescence has seven flowers. Autumn brings a lovely yellow colour to the leaves which in Spring/Summer are bright green and dense. This clone is perfect for avenues in a deer-park because the animals will eat the juicy epicormic shoots and create a well-defined 'browsing line', as in Dyrham Park, Tortworth, Stourhead, Knightshayes and many other properties. It is fascinating to walk underneath this canopy of dense twigs and foliage. On the other hand, with no animals, the dense shoots and foliage reach to the ground as may be seen at Brentry Court, and The Royals at Blaise Castle Estate.

The second early clone has no buttress roots and keeps a cylindrical trunk into old age. The bark loses its smoothness and appears fissured into narrow ridges, very similar to that of an old *T. platyphyllos* bark, suggesting that this time the seminal plant was the Broad-leaved Lime, rather than the Small-leaved Lime as the first clone suggests. The axis of the tree is not so vertical; branches diverge and the upper crown becomes hemispherical and very tall, taller than the other clone. The tree does not have many flowers, nor do the leaves turn yellow in the autumn but become grey brown before falling off. The flowers tend to have only four or five flowers rather than the seven of the other clone. They also do not have the dense witches broom effect in the lower crown. Examples of both these early clones are recognisable in mixed plantings at Hatfield and Cassiobury Park in Hertfordshire. It may be that some of the limes on Durdham Downs near Clay Pit Road, Westbury Park are of this type, as they certainly look like Broad-leaved Limes.

Modern street plantings are often the F2 seedlings of wild hybrids, which do produce some viable seeds. The F2 seedlings are selected and vegetatively reproduced by the thousand. However they still have the epicormic growths, which makes them very labour intensive, as the shoots must be removed each

year. As an alternative, local authorities and landscapers are now planting avenues of the two parents, *T. cordata* and *T. platyphyllos*, as at Ashton Court, and Blaise Castle. Both have clean trunks and are not subject to the aphid honeydew problem. The Limes near Tesco on Kellaway Avenue are Broad-leaved Lime, and at Frenchay Hospital, as trees are felled, they are being replaced by Broad-leaved Lime. Many Small-leaved Limes have been planted on Durdham Down, replacing Elms killed by Dutch Elm disease.

Another very popular lime, which grows fast and does not suffer from epicormic sprouts or aphids is the Caucasian Lime, *Tilia* x *euchlora*. This has been known since the mid-19th Century and is a hybrid from SE Europe between *T. cordata* and *T. dasystyla* from the Caucasus. It can be seen on the Downs opposite Rockleaze in a mixed lime avenue.

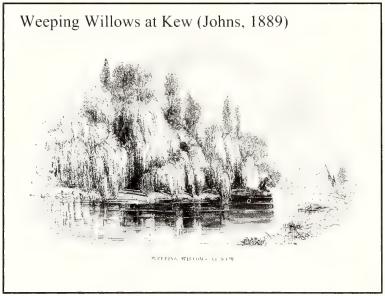
The champion Common Lime is in Gatton Park, Surrey. It is 44m high with a girth of 4.8m. At Stourhead, not far from the lake, is a specimen, that was 30.3m high and 10.2m in girth in 1991.

10) *Salix* x *sepulcralis* var. *chrysocoma* **Golden Weeping Willow**

The Weeping Willow is a very familiar species. Mitchell, says that it grows as far north as mid-Yorkshire, no further into the south west than south Somerset and no further west than Hereford and Shropshire. It is a hybrid between *Salix babylonica* from China and a species known as the Golden Willow, *Salix alba* var. *vitellina*, which is described by Loudon, 1842, as; "The yolk of an egg colour or the Yellow Willow or Golden Osier". The resulting Golden Weeping Willow has the botanical name *Salix* x *sepulcralis* var. *chrysocoma*. To appreciate this hybrid in any depth we must look closely at the parents and their origins.

The famous 18th Century botanist Carl Linnaeus named a willow in the Dutch Clifford Garden at Hartecamp and described it in 1738 in Hortus Cliffortianus. The willow had not flowered, so its sex was unknown at the time, but it later turned out to be a female. Linnaeus believed that this willow had come from ancient Babylon and was the willow of the Psalms, (Psalms 137:2), "By the rivers of Babylon, there we sat down, yea, we wept, when we remembered Zion. We hanged our harps upon the willows in the midst thereof". Babylon is on the Euphrates, south of Baghdad. In fact the trees mentioned were probably poplars. The Hebrew word 'Gharab' in biblical times meant Poplar, but it later came to signify Willow and was translated as such into vernacular English at the time of the Reformation. *Populus euphratica* was the tree favoured by Moldenke, whilst the Euphrates Aspen was favoured by others such as J. Smith in 1878.

Salix babylonica came from China many years ago and was carried along the ancient trade routes to south-west Asia. Clones of this species appear at various places along the route. Sir George Wheeler saw this plant in west Anatolia, Turkey, in 1676 and possibly even brought it to Britain. Today visitors to Anatolia and nearby Crete can see that the tree is widely planted, with its distinctive colour and shape. The tree was later to be immortalised by the poet Alexander Pope in his garden at Twickenham. Nurseries are documented as selling it in the early 18th Century. As it is not truly hardy in the U.K., specimens have often been lost to drought and frost. When Napoleon was buried on the small island of St. Helena in 1821 a plant of *Salix babylonica* was planted alongside the tomb. Subsequent visitors to the tomb looking for mementoes brought back cuttings, which were propagated by various nurseries as *Salix napoleonis*.


Weeping Willows at Kew (Johns, 1889)

Because willows are dioecious, that is the sexes are on different plants, some of the clones imported were male, some female. In this country all true *Salix babylonica* trees are female. All have brown twigs and shoots. The leaves are long, lance shaped with long slender points, finely toothed, up to 10cm long and 2cm wide. The leaves start off slightly silky, light green above and glaucous beneath, with silky hairs that drop off as the leaf matures. Stipules can be found at the base of young leaves. The Forestry Commission says that the champion *Salix babylonica* grows in Gladstone Park, Brent, and that it was 13 m high and 94cm in diameter when measured in 1990. The only other site I know is in the Royal Botanic Gardens, Kew.

The other parent of this hybrid is *Salix alba* var. *vitellina*, known as the Golden Willow. Loudon states that it grows in hedges but other authorities say that is does not occur in the wild. In contrast to the other parent, this one has bright orange and yellow new shoots and twigs, the leaves are fairly glabrous, and the upper surfaces are bright lustrous green. The natural variety *vitellina* has been used in the osier industry. It is usually seen in gardens as a heavily pruned coppice or short pollard, which will each year provide long brightly coloured growths for winter decoration. It is often seen as *Salix alba* var. *vitellina* 'Britzensis', which can be seen at Bath Botanic Garden. This male form is hardy, easy to propagate and was first put into commerce in Germany in 1878.

The hybrid is known as the Golden Weeping Willow. It was first described botanically by Louis Albert Dode in 1908 from material obtained from the famous German nursery Spaeth who listed it in their catalogue from 1888 as '*Salix vitellina pendula nova'*. Hillier lists two other pendulous varieties of *Salix* x *sepulcralis* and *Salix 'Erythroflexuosa*', which can be found on sale in garden centres and an earlier clone originating in 1864, *Salix 'Salamonii'*, which resembles *Salix babylonica*.

Conclusion

These ten hybrid trees are widely planted in the Bristol area. The Forestry Commission has many Dunkeld Larch, garden centres sell Leylandii as hedging, and the parks departments plant London Plane and European Lime in our streets. These hybrids are predominantly man-made, either by design, or simply as an accident, creating a plant that is more vigorous than the two parents, when they have been grown in close proximity. Of these ten, the only hybrid that has occurred in nature is the Common Lime, which has happened in the Wye Valley and on the continent. Many of the others have parents growing in different geographical areas.

Tony Titchen
3 Portishead House, 29 Nore Road, Portishead Bristol BS20 7HN
tel: 01275 848629; email: tony.titchen@treegazing.co.uk

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BRISTOL AND DISTRICT INVERTEBRATES REPORT, 2000

Compiled by R. J. Barnett
Secretary of the Invertebrates Section, BNS

Weather report, global warming, overview of insect surveys and notes on significant records.

Introduction

The weather in 2000 was very wet. Although the average temperature over the year was again very high, there were few long hot spells of sunshine. Spring and summer were in general damp and the autumn rainfall the highest ever recorded both nationally and locally. Early winter temperatures remained relatively very high until the last week of the year when a cold snap saw snowfall and penetrating frosts. As a result it was a poor year for insect records, though some interesting species were found by diligent recorders.

I am again very grateful to David Gibbs for providing a substantial list of very important records and notes on their significance. It is to be hoped that others undertaking entomological survey work in the region and hence in a good position to make such discoveries will also submit their records for publication in this report. We are also grateful to David Gibbs for providing the definitive illustrations.

Insect recording groups had a largely quiet year, consolidating their record gathering between the showers. Several Clouded Yellow butterflies were reported and moth migrants were also in evidence. At the National Moth Night meeting held at Weston Moor, for example, the Scarce Bordered Straw was attracted to the lights and, not far away as the moth flies, Convolvulus Hawk-moths were being recorded on the Gower Peninsular of South Wales. John Martin discovered a local specimen of this spectacular moth at Pill a few days afterwards. Of our breeding species of Lepidoptera, it seems as if the form *valezina* of the Silver-washed Fritillary was perhaps in greater evidence than normal. Sadly the BNS Invertebrate Section meeting at Troopers Hill seemed to confirm that the colony of Grayling at this city site has now died out. The earliest record of the Orange-tip received by the Avon Butterfly Project, was for 8th April and the latest 8th June. No records were received of the Duke of Burgundy or Pearl-bordered Fritillaries. However the Essex Skipper continued to be reported from around Bath. The Holly Blue had a poor year. Interest in the recording of Lepidopteran leaf miners increased substantially, largely thanks to the instigation of a national recording scheme coordinated by Martin Ellis of Somerset and by the ability to call upon the expertise of John Robbins at

Porlock for help with identification. John continued to kindly donate examples of the mines to Bristol Museum & Art Gallery. Both Gloucestershire and Somerset have produced information on the moth fauna of the surrounding areas. Roger Gaunt in Gloucestershire published 'Gloucestershire moths: an account' and Martin Ellis, Bill Urwin and Mark Yeates jointly authored '*A provisional atlas of the Somerset macro-moths*' from data submitted to the Somerset Moth Group. Both have provided invaluable background information for the records published here and for other records received by the Bristol & District Moth Group.

David Gibbs' records, particularly in the Hymenoptera and Diptera, reveal the potential riches to be discovered in our region. Even urban sites like Troopers Hill have been shown to host very important colonies of insects, in this case solitary bees and wasps in particular. The appearance of the Bee-wolf Wasp in the area reflects the national spread of certain species that have traditionally been restricted to the south of England and are now finding it possible to increase in range, thanks to the rise in average temperatures. Other sightings of rare species suggest that small colonies have persisted for many years but have been overlooked whilst others may have been under-recorded due to their small size or specialist identification skills required. Despite this, the non-specialist is still submitting very important data, for example the spread of the Lily Beetle in the area and observations on earlier emergences of butterflies such as the Orange-tip.

Observers mentioned in the species list:
Rich Andrews (RA), Mike Bailey (MB), Ray Barnett (RB), Bristol & District Moth Group (BDMG), Bristol Naturalists' Society Invertebrate Section (BNSIS), Robert Cropper (RC), Roger Edmondson (RE), Martin Evans (ME), Paul Fletcher (PF), David Gibbs (DG), Brian Lancastle (BL), John Martin (JM), Serena Parker (SP), Andy Pym (AP), Roger Symes (RS), Kurt Vickery (KV), Ann Wookey (AW)

My thanks also to those who, in addition, submitted records that do not appear in this report, but that help significantly to build up a picture of our invertebrate fauna, and to the Bristol Regional Environmental Records Centre (BRERC).
Scientific nomenclature follows the names given in Bradley (2000), Chandler (1998), Duff (1993) and Potts (1964). Definitions of national rarity are:
Red Data Book 1 (RDB1) Endangered.
Red Data Book 2 (RDB2) Vulnerable.
Red Data Book 3 (RDB3) Rare.
Red Data Book I (RDB indeterminate) Known to be either RDB1, 2 or 3 but insufficient data to assign a category.

Nationally Notable A (Na) Known from 30 or less 10km squares.
Nationally Notable B (Nb) Known from 31 to 100 10km squares.
Nationally Notable (N) Known from between 16 and 100 10km squares.

vc6 = vice county (North Somerset)
vc34 = vice county (West Gloucestershire)

SPECIES OF NOTE IN 2000

Insecta

Hemiptera
Alydus calcaratus (L.) Troopers Hill ST62 73 (vc34) 30 July (RB). A coastal species of sandy heaths, resembling a sand-wasp in flight. The only recent record of this striking bug around Bristol.
Stenodema holsatum (Fabr.) Goblin Combe ST47 65 (vc6) 23 July (RB). A species of damp woodland that generally prefers acidic conditions and so is not common in our region.

Lepidoptera (butterflies)
Argynnis paphia (L.) form *valezina* **Silver-washed Fritillary** Sandford Quarry ST42 59 (vc6) 16 July (KV). The dark form of the female, possibly commoner than usual during 2000 in the south west.
Hipparchia semele (L.) **Grayling** Sandford Quarry ST42 59 (vc6) 16 July (KV). A species giving concern in the region. All records are important.

Lepidoptera (macro-moths)
Synanthedon formicaeformis (Esp.) **Red-tipped Clearwing** (Nb) Weston Moor ST44 73 (vc6) 26 July (DG). Netted over nettle patch, taken initially for an ichneumon wasp or possibly a sawfly of the genus *Xiphidria* in flight. Widespread in England but like most clearwings has to be searched for. Only recently recorded at a couple of sites in Gloucestershire and at Shapwick in Somerset. May repay searching at suitable sites.
Rhodometra sacraria (L.) **Vestal** Filton ST611 794 (vc34) 26 September (AP), Whitchurch ST607 676 (vc6) (RA). A migrant recorded most years in the region.
Epirrhoe rivata (Hb.) **Wood Carpet** Dolebury Warren ST452 586 (vc6) 18 June (RA, ME, BL, JM). Only present at half a dozen sites in Bristol region; care must be taken to distinguish it from the Common Carpet.
Agrius convolvuli (L.) **Convolvulus Hawk-moth** Pilning ST556 849 (vc34) 2 October (JM). An occasional migrant to our area, sometimes confused with the

Privet Hawk Moth that is still common locally.
Macroglossum stellatarum (L.) **Humming-bird Hawk-moth** Easton ST613 742 (vc34) 3 July (SP). A migrant day-flying moth. It is surprising that there were not more records this year.
Lithosia quadra (L.) **Four-spotted Footman** Dolebury Warren ST452 586 (vc6) 18 June (RA, ME, BL, JM). Not known to be resident in the area, this was presumably an immigrant from resident populations in counties to the south.
Callimorpha dominula (L.) **Scarlet Tiger** Clevedon ST418 723 (vc6) 24 June (AW) imagines in garden. Widespread in and around watercourses, unusual in a suburban garden.
Mythimna vitellina (Hb.) **Delicate** Timsbury ST659 587 (vc6) 27 September (MB). A regular immigrant to southern England but very rarely recorded in Bristol region.
Mythimna unipuncta (Haw.) **White-speck** Timsbury ST659 587 (vc6) 7 September (MB). A regular immigrant but rarely seen around Bristol.
Cosmia affinis (L.) **Lesser-spotted Pinion** Branscombe Road, Bristol ST553 760 (vc34) 23 August (ME). Thinly scattered over the region; larva feeds on Wych Elm.
Helicoverpa armigera (Hb.) **Scarce Bordered Straw** Weston Moor ST445 735 (vc6) 23 September (BDMG). An immigrant only seen in the Bristol region six times in the last ten years.

Lepidoptera (micro-moths)
*Phyllonorycter muelleriella (*Zell.) (Nb) Tucking Mill, Somerset ST76 61 (vc6) 2 August (DG). Reared from an oak leaf mine collected on 23 July. Several recent records in Gloucestershire, only a few old records known from the north of Somerset. Probably under-recorded but also likely to be spreading.
Coleophora saturatella Stt. Troopers Hill ST62 73 (vc34) 30 July (DG). Imago swept, identified by dissection. Subsequently three empty characteristic larval cases were found at the same site. First known record in the region.
Ethmia dodecea (Haw.) Gorse Covert, Westerleigh ST715 785 (vc34) 3 July (RE, ME). Only about the third site in the last ten years for this very local species.
Ethmia quadrillella Goeze (=*funerella*) (Na) Cheddar Wood ST44 55 (vc6) 4 June (PF). Not recorded in Somerset since 1917 and now largely confined to the Cambridgeshire and Huntingdonshire fens. (Fletcher, 2000)
Pancalia leuwenhoekella (L.) (Nb) Walton Common ST 423 735 (vc6) 7 May (RB); Tucking Mill ST 76 61 (vc6) 23 July (DG; det. Dr John Langmaid). Few recent records in the region. The latter record is of particular interest as only recently has it been shown to have a small second brood in July in some years (J. Langmaid pers.comm., DG) a possible effect of global warming.
Batachedra praeangusta (Haw.) Whitchurch ST607 676 (vc6)18 July (RA).

Very local, only one or two recent records in the region.

Grapholita molesta (Busck) Branscombe Road, Bristol ST55 75 (vc34) 27 December (ME). Occasionally imported to the UK with fruit, and in this case believed to have emerged from peaches on which the pupa was presumably attached. Originally native to China and Japan but now widely distributed where peaches are grown. Thought to be the first record for the region and Gloucestershire.

Calamatropha paludella (Hb.) (Nb) Oldbury Power Station ST607 942 (vc34) 28 July (BDMG). Records from the last 2 years suggest this has become established on both sides of the Severn Estuary and is currently a breeding species. Previously thought to be restricted to the south and east coasts with occasional individuals wandering elsewhere.

Ebulea crocealis (Hb.) Max Bog ST404 576 (vc34) 30 June (BDMG). Only the third site found in recent years for this very local species.

Palpita vitealis (Rossi) (=*unionalis*) Pilning ST556 849 (vc34) 3 October (JM). This startling white immigrant is very rarely recorded in the Bristol region.

Apomyelois bistriatella (Hulst) ssp. *subcognata* (Rag.) Max Bog ST404 576 (vc6) 30 June (BDMG). A very local species recorded from Surrey, Hampshire, Isle of Wight, Dorset, Devon and Shropshire before this record. Larvae feed within the fungus, *Daldinia concentrica*.

Pempelia formosa (Haw.) Whitchurch ST607 676 (vc6) 20 July (RA). A species whose larvae feed on elm in hedgerows, but very local in southern England.

Pterophorus spilodactylus (Curtis) RDB2, provisional Compton Hill ST 39 55 (vc6) and Wavering Down ST 40 55 (vc6) 4 June (DG); Brean Down ST 29 58 (vc6) 10 June (DG). The larval food plant *Marrubium vulgare* **White Horehound** is itself scarce. Dozens of caterpillars were found at these sites and the adults were reared from them. There are about five colonies known in Britain, on the Isle of Wight, the chalk downs of south east England and Great Ormes Head in North Wales (A. Davis pers.comm., DG). These are thought to be the first records in this region since 1926 (Turner, 1955).

Pterophorus spilodactylus (female)

Coleoptera (beetles)

Hydrophilus piceus (L.) **Great Silver Diving Beetle** RDB3 Clapton Moor ST 45 73 (vc6) 4 September (DG). One individual in a dip net sample. Somerset is its main stronghold in the UK where it seems to be holding its own, elsewhere possibly declining.

Lomechusa paradoxa Gravenhorst RDB indeterminate Brean Down ST 29 58 (vc6) 30 April (DG). Taken fortuitously in flight on the south facing slopes. This odd looking little staphylinid is associated with ants. It was last recorded in Britain in 1931 and the only previous Somerset record was 140 years ago (Gibbs, in press). (DG.)

Geotrupes pyrenaeus (Carp.) (Na) Compton Hill ST 39 55 (vc6) 29 July (DG). A very local species in southern England. In Somerset it is only known from Neolithic sub-fossils from the peat at Shapwick (Duff, 1993), this then seems to be the first county record since the Stone Age!

Onthophagus fracticornis (Preyssler) RDB indeterminate West Mendips ST 45 (vc6) 4 June (DG, det. Darren Mann) This endangered dung beetle was historically only known from a single site in the New Forest and from a few specimens without data. More recently recorded from North Wales and possibly one from South Wales. This male is the first for Somerset (D. Mann pers. Comm.; DG).

Phyllopertha horticola (L.) **Garden Chafer** Brown's Folly, Bathford Hill (south) ST7966 (vc6) 28 May (RC). Widespread but local.

Agrilus sinuatus (Oliv.) (Na) Folly Farm ST 614 603 (vc6) February (DG). Exit holes of this species found at numerous sites; the only adults seen were two reared, which emerged in June, from the branch of a Hawthorn cut from a hedge in February. Identification of the exit holes has shown this species to be widespread in the region, although adults are as elusive as ever.

Dirhagus pygmaeus (Fabr.) RDB3 Kings Wood ST4564 (vc6) 25 June (RB); Brown's Folly ST79 65 (vc6) 29 June (DG). Swept from understorey vegetation. Although associated with old woodland, appears to be doing well locally with several sites in Somerset and Gloucestershire.

Prionychus ater (Fabricius) (Nb) Ashton Court ST 55 72 (vc6) 22 April (DG). Three beetle larvae were collected in March 1999 from the rotting heartwood of a veteran oak. On 22 April two of them emerged, the third a few days later. There are very few records anywhere in Somerset or Gloucestershire; the last in the Bristol region was at Long Ashton in 1919 (Duff, 1993; Atty, 1983). (DG.)

Strangalia melanura (L.) Kings Wood ST4564 (vc6) 25 June (RB). A widespread but very localised longhorn beetle.

Lilioceris lilii (Scop.) **Lily Beetle** Walton St. Mary, Clevedon ST413728 (vc6) 8 April (RS) several mating pairs. Recorded new to the area in 1998/9, pest of lilies in gardens. A striking red beetle.

Trichosirocalus dawsoni (Brisout) (Nb) Brean Down ST 28 (vc6) 30 April (DG). This minute weevil is widespread in Britain, often numerous where found, but local (Hyman, 1992). Although it is certainly under recorded, in the southwest it should be found in any dry coastal locality where it is searched for. This is the first record for Somerset (K. Alexander pers. comm., DG).

Hymenoptera (bees, wasps and ants)

Philanthus triangulum (Fabr.) **Bee-wolf Wasp** Yeovil ST538145 (vc5) 20 August (RC); Troopers Hill ST62 73 (vc34) 30 July (BNSIS). Expanding its range in southern England.

Piogaster albulina Perkins (3rd British specimen) Goblin Combe ST 47 65 (vc6) 6 April (DG; det. Dr Mark Shaw). A single female of this ichneumon wasp emerged, apparently from an oak marble gall collected on 5 March. Its host is unknown but thought to be spiders; perhaps a parasitised spider crept into a hole in the gall to die. The specimen is retained in the National Museum of Scotland.

Leptothorax albipennis Curtis (Na) Avon Gorge ST 56 74 and ST 56 73 (vc34) 8 June (DG); Brean Down ST 29 58 (vc6) 10 June (DG). This tiny yellow ant is very localised and mainly confined to the coast of southern England. In this region it is only known from Durdham Down (Perkins, 1925, as *L. tuberum*) and Goblin Combe (Collingwood, 1960). As one of its most northerly British stations, this warmth loving species will be highly vulnerable to the over-shading of its habitat, but may benefit from an increasingly warmer climate.

Pemphredon rugifer (Dahlbom) RDB3 Avon Gorge ST 56 74 (vc34) 18 July (DG). A single male of this entirely black solitary wasp was found in the Great Quarry. It is widespread in England but very uncommon and locally only known by a single record in West Gloucestershire (Alexander, 1999a). It nests in holes in dead stumps, fallen logs, fence posts and similar situations, stocking the cells with aphids.

Andrena falsifica Perkins Na Crook Peak ST38 55 and Compton Hill ST39 55 (vc6) 4 June (DG). This black mining bee is very local in southern England; in Somerset it was not recorded by Perkins (1925) but listed for vc6 by Falk (1991a).

Nomada guttulata Schenck RDB1 Troopers Hill ST62 73 (vc34) 15 June (DG). The host of this species, *Andrena labiata*, has been increasing in recent years but *N. guttulata* still remains very rare with only about five recent localities. There are no historical records from Somerset or Gloucestershire, even from the days when *A. labiata* was a more frequent species. Troopers Hill harbours a small colony of *A. labiata* and one specimen of this black and red nomad-bee with small yellow spots on the abdomen was confirmed as this species by Mike Edwards.

Nomada signata Jurine RDB2 Wavering Down ST4055 (vc6) 29 April (DG). One female of this cleptoparasite of *Andrena armata* the common Tawny Mining Bee was found. Although very boldly marked with yellow bands, this nomad bee could easily be missed amongst the very common *N. flava*. Recently it has been found at only a few localities in England and Wales with the best sites in South Wales (Falk, 1991a), which is difficult to explain given the

frequency of its host. Locally it is only known from 19th century records 'in the Bristol district' (Perkins, 1924); this is probably the first record from Somerset.

Diptera (flies)

Bombylius canescens (Mik.) (N) Cheddar Gorge (south) ST4754 17 June (RC), one by road visiting blooms of Herb Robert. A very local bee-fly, also known from Dolebury Warren.

Ormosia bicornis (de Meijere) RDB2 Dowlings Wood ST60 60 (vc6) 12 September (DG). Three male specimens of this small brownish crane-fly were swept from the understorey. This very scarce fly has only been found at three sites since 1960 (Falk, 1991b) including an old record from Gloucestershire (Alexander, 1999b) but this is the first record for Somerset.

Mycetophila autumnalis Lundstrom RDB3 Monk Woods ST75 70 (vc34) 22 September (DG). A single male of this brown fungus gnat swept from foliage. Known from 24 sites in 17 counties but not previously from Somerset; however it is likely to be under recorded (Chandler pers.comm., DG).

Mycetophila eppingensis Chandler RDB indeterminate Dowlings Wood ST60 60 (vc6) 12 September (DG; det. P.J.Chandler); Monk Woods ST75 70 (vc34) 22 September (DG; det. P.J.Chandler). Two males of this fungus gnat were swept from the understorey. So far this species has been recorded from Essex, Oxfordshire and Hampshire and at the time of this discovery in Somerset it had yet to be formally described. These are the first records from the West Country (Chandler, 2001).

Mycomya occultans (Winnertz) RDB1 Brown's Folly ST79 65 (vc6) 29 June (DG); Monk Woods ST 75 70 (vc34) 22 September (DG). First recorded in Britain from South Wales in 1956 and 1989 (Chandler, 1992). Since then it has been recorded at a few localities in Kent and Berkshire but these are the first records for Somerset (Chandler pers.comm., DG).

Neoempheria bimaculata

Neoempheria bimaculata (von Roser) RDB2 Monk Woods ST75 70 (vc34) 22 September (DG). A single male of this fungus gnat, the fifth British record and the first for the region. Previously only known from Hampshire, Oxfordshire, Wiltshire and Essex (Chandler pers. comm., DG).

Haematopota grandis Meigen RDB3 Littleton Brick Pit ST 59 91 (vc34) 4 August (DG). A single female of this grey horse-fly was found. Recently it has only been recorded from four coastal sites in southern England and South Wales (Drake, 1991) including two records from the Severn in Gloucestershire (Alexander, 1999b).

Villa cingulata (Meigen) RDB1 Tucking Mill ST76 61 (vc6) 19 July (DG). Three individuals of this bee-fly with striking pale bands on the abdomen, all of them females, were seen at this site. The species was last seen in Britain in 1938 and was presumed extinct (Stubbs, 1997). Most historical records are from Oxfordshire with others in Devon, Wiltshire, Hampshire and Kent (Falk, 1991b). There are no historical records from either Gloucestershire or Somerset, however a sighting of what may have been this species was made in the Cotswolds during 2000 but the specimen was not caught for confirmation (*British Wildlife* 11 (6): 441). On a European level the identity of this species depends on examination of the male genitalia so, although of the known British species it can only be *V. cingulata*, the possibility of it being a species new to Britain has not yet been ruled out.

Platypalpus excisus (Becker) RDB3 Brean Down ST2958 (vc6) 19 April (DG). A single male of this small black and yellow Empid fly was found. This species has only recently been recognised as distinct from the commoner *P. nigritarsis* and so its national and local status is not clear.

Platypalpus mikii (Becker) RDB3 Brown's Folly ST7965 (vc6) 29 June (DG); Dowlings Wood ST60 60 (vc6) 3 July (DG). A few individuals of this small black and yellow Empid fly were swept from shady understorey. It was only added to the British list in 1978 (Chandler, 1998) and there do not seem to be any previous records for the region.

Agathomyia cinerea (Zetterstedt) (N) Cleeve Heronry ST46 66 (vc6) 4 October (DG). Two female examples of this small grey flat-footed fly were swept from the vicinity of a large fallen branch. It has only recently been confirmed as British (Chandler, 1998) and is so far only recorded otherwise from Surrey, Herefordshire, Hertfordshire and Buckinghamshire (Chandler pers. comm., DG).

Thecophora fulvipes (Robineau-Desvoidy) (N) Monk Woods ST 75 70 (vc34) 22 September (DG). A single male of this rather elusive bee-killing fly was found on a Devil's Bit Scabious flower. Although widespread in Britain this is thought to be the first record in this area since 1948 (Audcent, 1950).

Goniglossum wiedemanni (Meigen) (N) Weston Moor ST44 73 (vc6) 14 July (DG). A single individual found on White Bryony. It has a scattered distribution across southern England, locally known from a single record in Gloucestershire, (Alexander, 1999b) and a single locality in Somerset, (Audcent, 1950).

Gonioglossum wiedemanii

Lonchaea bukowskii Czerny (3rd British specimen) Dowlings Wood ST60 60

(vc6) 3 July (DG; det. I. MacGowan). A single female of this shiny blue-black fly was swept from the understorey. At the time of discovery this species had not been added to the British list, the only other two specimens coming from Burnham Beeches. The specimen is deposited in the National Museum of Scotland.

Lonchaea peregrina Becker (N) Monk Woods ST75 70 (vc6) 24 May (DG). Several pupae were collected from under bark on this date. The largest of these, found under the bark of dead ivy, emerged on 7 June and proved to be a male of this species. There are very few confirmed reports in Britain but they include an old record from near Bristol (Collin, 1953).

Eurina lurida Meigen RDB3 Littleton Brick Pit ST59 91 (vc34) 22 May (DG). A single male of this Chloropid fly swept from *Phragmites*. It is recorded from Devon, Hampshire, Kent, Essex, Pembrokeshire, Glamorgan and Dumfries (Alexander, 1999b; pers. obs.); locally there is a single record from Hallen in 1927 (Audcent, 1950).

Sturmia bella (Meigen) (3rd British specimen) Goblin Combe ST47 65 (vc6) 16 February (DG; det. P.J.Chandler). A pupa of a Speckled Wood butterfly found under a tussock of grass on this date produced an adult parasite fly on 18 March. This species has either been overlooked or is rapidly colonising, as the previous two records are very recent and there have been several since.

Arachnida

Araneae (spiders)

Aelurillus v-insignitus (Clerck) Nb Brean Down ST2858 and ST2958 (vc6) 30 April (DG). A single sub-adult that seemed to be this species was found on open scree on this date, its identity being confirmed when several were seen close to the steps on 10 June. This very attractive and distinctive jumping spider is almost entirely confined to the south of England from Cornwall to Sussex and north to Suffolk; there do not appear to be any previous records for Somerset (Merrett, 1990).

Episinus truncatus (Latreille) Nb Avon Gorge ST5674 (vc34) 8 June (DG). A single female swept from The Gully. This very characteristic spider with a truncate tip to the abdomen is usually associated with southern heathlands from Cornwall to Sussex and north to Oxfordshire. It has apparently not previously been recorded from either Somerset or Gloucestershire (Merrett, 1990).

R. J. Barnett Head of Collections
City Museum & Art Gallery, Queen's Road, Bristol BS8 1RL.
email: ray_barnett@bristol-city.gov.uk

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'Expression of millepedes'

'Take of live millepedes,(commonly called woodlice,) three ounces; simple fennel water , one pint; compound horse-radish water, half a pint. Bruise the millepedes, gradually adding to them the distilled waters; and afterwards press out the liquor.

This is an excellent diuretic, sweetener and cleanser of the blood and a most efficacious medicine in all chronic cases that are to be relieved by promoting the urinary discharges, as are many inveterate ulcers, strumas and scrophulous disorders - '

From '*Culpepper's Dispensatory*', Nicholas Culpepper (1616-1654)

(The editor takes no responsibility for any adverse reactions on using this remedy.)

On the derivation of names associated with the Lime tree.

'In London and Wise's *Retired Gardener* the name of *Tilia* is derived from the Greek word *ptilon,,* a feather, from the feathery appearance of the bracteas; but others derive it form the Greek word *tilai*, light bodies floating in the air, like wool or feathers. Tilleul is from *tailler**, either because the tree bears pruning well, or the wood may be easily carved. Bast-holz is literally bast wood, in allusion to the use of the bark, in forming mats.'

J.C. Loudon, (1843) in *Arboretum et Fruticum Brittanicum* p. 63

(* French - tailler (vigne): to prune (the vine); tailler (bois):to carve (wood) – editor)

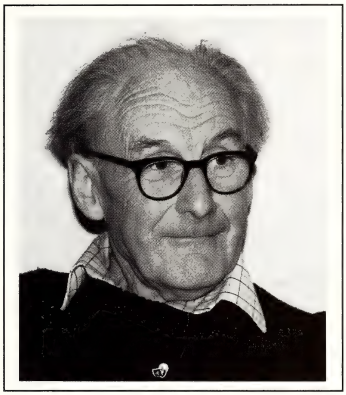
Proceedings of the Bristol Naturalists' Society (2000) ***60****: 79-82*

OBITUARIES

John Boyd, 1914 - 1999

By Janet Boyd and Robin Williams.

We are sorry to report that John Boyd, from Draycott in Somerset, died on Good Friday, April 2nd, 1999 at the age of 83. Members who met John will remember a quiet man devoted to natural history and conservation, to the extent that he would bring a hammer and nails to fix bark disturbed in hunting for ants, slugs, woodlice or whatever was to be found on a fallen log. He loved to be outdoors, whether in his garden or in the field, and was well known for his ability to pass on his knowledge to others.



Apart from the war years, when he was an officer in the Royal Artillery, John spent all his working life in Bristol and ended his career as senior partner in a firm of solicitors. He was present at the making of history when acting in his legal capacity at the Belsen war crime trials.

Natural history had been a passion from an early age, and John's particular interest in dragonflies led to his being recognised as a national authority on their changing distribution. On his retirement, he managed two reserves for the Somerset Wildlife Trust and also set up a team to monitor the plants of the Trust's reserves. Encouraged by the regular support for this group, which met weekly for many years and is still flourishing, John formed a small Invertebrates Group with the intention of passing on his knowledge of dragonflies. Members were so excited by his enthusiasm that they refused to give up at the end of the dragonfly season and the group greatly expanded its interests under his leadership, looking at slugs and snails, other invertebrates and, of course, plant galls and their inhabitants. John was a member of the Bristol Naturalists' Society at the time of his death and Society members were part of both his Plant Monitoring and Invertebrates Groups. John was a very fine photographer of both insects and plants and he

gave tremendous help in developing members' skills, especially in close-up photography. He gave many talks to wildlife trusts and other organisations, as well as setting up the memorable annual slide shows for members of the Invertebrates Group to show off their years' photographic production.

Only a few days before his death, John was busily searching for galls and enthusiastically looked forward to the next Gall Society Weekend. Sadly he did not make it.

John is sadly missed by all who knew him and by all who remember his enthusiasm, kindness and remarkable ability to pass on knowledge. Many people who have been stimulated to care about our natural environment through his wisdom and understanding will continue to share this love of nature and will undoubtedly spread the conservation message to others.

A great man, greatly missed.

(The text above is a slightly augmented version of that which appeared in the British Plant Gall Society Journal for Autumn, 1999 by permission of the Editor)

The picture above is by the late Dick Ellingham. Reproduced from *The Avon Widlife Trust Magazine*: Number 24, Summer 1988 by kind permission of Pat Ellingham

Aubrey Herbert (John) Weeks 1919 – 2000

By Ray Barnett

When John Weeks submitted his 1999 Weather Synopsis, for subsequent publication in the Invertebrate Report of the Bristol Naturalists' Society Proceedings for that year, he wrote that he felt he would not be able to contribute the article in future due to advancing years. Sadly this proved to be all too prophetic and John died in 2000.

Although named after Aubrey Herbert the politician, his step-mother (following his natural mother's death in 1932) had trouble remembering all the names of her six children and so called them all John. This was to stay with him all his life. A Bristolian by birth, John grew up in Totterdown and attended Victoria Park Boys School in Bedminster and then obtained a scholarship to Bristol Grammar School.

After wartime service, marriage to Barbara preceded a career in the Civil Service with the Ministry of Labour in Bristol, and a residential move to Yatton. However in the early 1960s the family (now including daughter Priscilla and son James) moved to London as John's career developed and work at the Department of Employment included briefing the Ministers of the day.

John retired to Yatton at the end of the 1970s but was sadly restricted in enjoying his various hobbies by a heart attack in 1980. Despite this, John's long-term interests in the climate and butterflies, continued to be a driving passion. These two combined well to produce an extremely useful source of information of relevance to the whole insect section of the Bristol Biota reports. John's contributions began in the 1980s and became an annual and important reference point for twenty years. As he explained at one point, his weather summary was compiled from a meteorological station at Yatton and therefore

potentially differed in detail from weather reports in other Biota sections, compiled from other data, but the overall results were always significant.

John always submitted his sightings of butterflies and moths to the Proceedings, including important observations at Goblin Combe and other localities. Watching and recording Lepidoptera obviously gave him great pleasure. However, latterly these records had necessarily been restricted to his garden. Much has been said in recent years about global climate change, and linking this to butterflies, especially observing changes in first or last appearance each year, thus providing contributory evidence for the conclusion that this is a genuine phenomenon. In this way his interests have contributed to a better understanding of our local wildlife and drawn attention to the declines that have been witnessed.

Our sympathies are with John's family, and these Proceedings are less valuable this year without his report. My thanks to Priscilla Huggins for providing information on her late father's life.

The picture above is from *'Sweet Thames Run Softly'* by Robert Gibbings, (1941), reproduced by kind permission of Reading University Library.

Proceedings of the Bristol Naturalists' Society (2000) ***60****: 83-86*

THE FLORA OF THE BRISTOL REGION

A review by R.L.Bland.

Few books can have had a longer gestation, or been more eagerly awaited. The new Flora is a huge stride ahead of all previous such works because it provides maps for almost every species on a one kilometre scale, and allows the non-botanist to see at a glance whether the species that he was so surprised to notice in his garden is in fact a local rarity or a commonplace plant that he has previously failed to recognise. Everyone can identify the particular spot they know best and discover what it contains, and, with glee, what sins of omission the vast apparatus of research has committed. One might have wished that the maps had been bigger, but doubtless then they would have had to be fewer, and it is very much in this Flora's favour that species with as few as four one-km squares are mapped as carefully as those with 1500.

Orobanche hederae

The maps answer questions frequently posed but also raise as many questions. Why do species like Buddleia, Tall Melilot, Weld, Hoary Cress, Thale Cress, Procumbent Pearlwort, Yellow Corydalis and Purple Toadflax seem to love the city of Bristol? Why so often in a family does one species dominate the scene, happily present in every sort of habitat in the county, leaving the other members of the family with tiny scattered distributions? There is also a more fundamental query raised by the little blocs of distribution of some species. How far do these represent the skill of the observers rather than the distribution of the plants? It is a pity that the total number of species in each square is not given anywhere, and that there is also no indicator of the effort that went into each square.

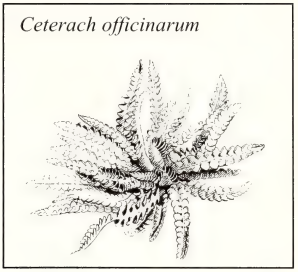
I am struck in particular by the idea that, fascinating as the weeds of arable fields may be, they belong to a world that is almost gone, and we should be studying the weeds of gardens. They represent a habitat probably as large as the arable area in the region today, and yet by their nature they are largely ignored. My own experience of gardens is that each one I have temporarily been in possession of has had its own particular weeds. As the promotion of biodiversity is now a matter of public concern, and gardens are where most people start to understand the nature of diversity, it should not be difficult to use public concern and public enthusiasm to study such weeds. The maps of the distribution of Trailing Bellflower, a plant that for long puzzled me because none of the books of native plants mention it, suggest that there is much work to

be done in this field, as it is certainly more widespread than shown.
The treatment of trees has clearly posed unresolved problems. Alien plants that manage to survive without cultivation are treated with great thoroughness, but alien trees that, in the majority of cases, have inevitably originally been planted by man, tend to be completely ignored, though there are unexplained exceptions such as Horse Chestnut. Some appear to be recorded if they are thought to be self-sown by the observer- the *Ailanthus* is a case in point, as is perhaps the Norway Maple. But, for instance, to suggest that the Wellingtonia, as a 'planted landscape feature', is only present in four one-km squares in the region is a palpable absurdity which will greatly puzzle our descendants when they see dozens of trees more than a century old. The majority of alien tree species are, regrettably, ignored completely, and it seems to me clear that a proper tree atlas of the county is urgently needed as a sequel.

Mrs Ann Wookey (President, BNS) studying the new flora with Dr David Bellamy at the launch on 27th February 2001 in Blackwell's book-shop.

There is also one statement in the book with which I must take issue. It is quite wrong to single out G. H. Wollaston by name for his alleged actions in 1897 of attempting, as he saw it, to add to the botanical diversity of the Gorge, assuming of course that the attribution is correct, for the evidence is circumstantial at best. It is also wrong to judge the past by the values of the present. The Gorge in 1897 was subject to continuous quarrying. Many people apart from G.H. Wollaston added plants to the Gorge including, to mention just a few of the larger species, Black Pine, Lombardy Poplar, Turkey Oak, Holm Oak, Himalayan Cotoneaster, *Garrya elliptica*, *Viburnum tinus*, Hornbeam, Pear and Apple. Part of the Gorge near Sea Walls was made into a vineyard which is still in use. In our own day huge areas of the rock face were blasted, and then covered in netting simply to ensure that the council did not get sued by motorists hit by falling rocks. In the rest of the world a notice 'Danger, Falling Rocks' suffices. Yet the individuals responsible for all this devastation get no word of blame.

G.H. Wollaston taught Biology and Zoology at Clifton College from 1873 to 1899 at a time when such sciences were taught nowhere else in Bristol. He took over the first Botanic Garden in Bristol from A. Leipner, who became the first


Ceterach officinarum

Professor of Botany at Bristol University, and who founded the Bristol Naturalists' Society when he arrived in Bristol to teach at Clifton in 1862. This garden was replaced in 1880, ironically enough, by a state of the art science block, which stands to this day. *Allium roseum*, *Nectaroscordum siculum* and *Allium carinatum*, all from southern Europe, are attractive *Alliums* and doubtless formed part of Wollaston's own collection. Wollaston was probably an enthusiastic plantsman rather than a botanist as J.W. White, who must have known him until he left Clifton in 1899, does not mention him in his list of local botanists. J.W. White refers obliquely to the provenance of the three *Allium* species first noted in 1904, (five years after Wollaston had left), and calls whoever introduced them "a misguided enthusiast". If that enthusiast were G.H. Wollaston, then perhaps he deserves a plaque at the entrance to Bracken Ridge, the present University Botanic Gardens, of which indirectly he was an early inspiration.

Finally, to look to the future. Some of the maps already look a bit historical. I know that Danish Scurvy Grass has ridden the salt spray of every motorway, and spread beyond to the A38 and A4 at least. It is part of the excitement of a book like this that it offers the possibility of effective monitoring of the process of change. A random annual survey of a mere 150 kilometres squares, a 10% sample, would enable change for a substantial proportion of species to be measured with statistical accuracy. Such a survey, repeated annually, would have covered every square in the county within ten years, and would thus provide the data for a second edition. Certainly this publication, like White's flora before it, must be regarded as the start of a whole new approach to

understanding the way in which our native plants are responding to the huge environmental changes they are subject to. The new Flora is a formidable achievement, reflecting great credit on BRERC and the numerous individuals who contributed to it. Isaac Newton was merely repeating a familiar idea when he said that he had been able to see further than others because he stood on giant's shoulders. The new Flora is a giant we must all ride.

The Flora of the Bristol Region, by I.P. Green, R.J. Higgins, Clare Kitchen and M.A.R. Kitchen, edited by Sarah Myles, is published by Pisces Publications, Newbury (2000) 276pp. ISBN 1-874357-18-8. It is available from The Bristol Regional Environmental Records Centre, Ashton Court, £27.50.

Illustrations above are from drawings by Brin Edwards that appear in this book. They are reproduced by permission of the artist, Pisces Publications and Bristol Regional Environmental Records Centre

R.L.Bland.
11 Percival Road, Clifton, BS8 3LN
email: rbland1@compuserve.com

"... nearly every botanist of note from the foundation of the British Flora down to the present time – all made the pilgrimage to Bristol as to a botanical Mecca, attracted by the fame of her scenic loveliness and rarity of her limestone plants" From J.S. White (*The Bristol Flora,*1912*)* quoted in the above book.

'The Beech' - is a wood engraving by Joan Hassall reproduced from *Collected Poems* by Andrew Young, 1950 Jonathan Cape, by kind permission of Brian North Lee, of Ruth Lowbury and of the publishers.

The Frome Valley Walkway Booklet, Forest of Avon Team, Bristol City Council, South Gloucestershire Council and Cotswold AONB Partnership (free of charge).

This is a slim booklet of thirteen maps folding into one third of an A4 sheet. Starting at Castle Park in the centre of Bristol and leading in gentle stages of about one and a half miles per map out to Old Sodbury at the foot of the Cotswold Hills and following the course of the River Frome. It provides, in a very accessible form, the encouragement for people to dip into the delights of the valley of the River Frome. Its accessibility is achieved initially by the very colourful attractiveness of both cover and contents and by the handiness of its shape and size. It can be obtained from many outlets such as Public Libraries, especially in the South Gloucestershire area.

The inside of the front cover is a map of Bristol and South Gloucestershire, showing seven local long-distance paths of the region. Snaking centrally through the midst is the Frome Valley Walkway with its four junctions to some of these other Ways and Paths. Almost every map has a characteristic photograph of that part of the walk. All the field boundaries, woodlands, bus stops, public houses, churches, access points and even the names of streets are mapped, where appropriate. Every map has a few words describing the route at that point and any points of interest in buildings, scenery or wildlife. Take map 7 as an example of the gently friendly tone of the book: 'At Frampton Cotterell the path passes round St Peter's Church, rebuilt in the late 19th Century but retaining the original tower from medieval times. The old pound gate can be found in the churchyard wall, although the original pound, where stray animals found in the village were kept, was on the opposite side of Church Road.'. The first three pages after the area map and key, cover 'The Frome Valley Walkway', 'History of the River Frome' and 'Walking in the Frome Valley'; then we have map 1, which shows the start of the route at Castle Park. Beyond map 13 there are three more pages giving, respectively, 'Public Transport Information', first buses, then trains, then 'Further Information', which describes the Forest of Avon, and it finishes with the Country Code.

Tony Smith. President BNS, 2000
Further information and copies can be obtained from: 0117 953 2141.

COUNCIL 2000

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Vice-President:	Mrs A.M. Wookey
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Hon Treasurer:	Mr R.G. Symes
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	Secretary	Mr R.J. Barnett

Other members of Council: Dr J.M. Gething, Mr. H.G. Morris, Mr D.W.R. Strawford, Miss S.L. Myles, Mr N.J. Wray, Ms S.E. Hallett.

Proceedings of the Bristol Naturalists' Society (2000) ***60****: 89-96*

REPORT OF COUNCIL

Aims. The promotion of education and research into natural history including geology, with special reference to the Bristol District and the promotion and the conservation of the British fauna and flora and protection of geological and physiographical sites.

Organisation, membership and activities. An annually elected Council, under the chairmanship of the President runs the Society, both directly and through its component Sections and Committees. There are four Committees, Field, Publications, Library and Hector Hockey Fund and five Sections, Botanical, Geological, Invertebrates (successor to the former Entomological Section), Mammal (not a section but a Group) and Ornithological. There are 26 Officers and up to nine ordinary members of Council. Mr Peter Belcher was appointed Honorary Secretary in April. Council has approved a new honorary post of Website manager. The Society has started a membership drive, asking all members to enrol friends using the new membership leaflet. This year, upon the recommendation of the Charity Commissioners, the Publications and Library Committees have been scrutinised by a working party under Richard Bland. The working party defined the roles of the committees, and proposed that they should set budgets, and that the Publications Committee should be responsible for the Bulletin and the Website, as well as the Proceedings and any occasional publishing initiative. Council welcomed the report and is presenting the recommendations to the 2001 AGM for approval by members and incorporation within BNS Procedures. This year, in May, the Society organised a dinner, both to mark the Millennium and to mark the exact place and almost the exact date one hundred and thirty eight years since the inauguration of the Society.

Mr Tony Smith welcoming the new president, Mrs Ann Wookey on her election at the AGM on 13th January 2001.

Education. A series of 24 meetings in the Winter was organised by the Sections and the President and 30 field meetings in the Summer were organised by Sections and the Field Committee; the latter, with the Ornithology Section and Mammal Group, arranged extra outdoor meetings in the Winter. An innovation is the donation of one inter-disciplinary meeting from each Section to the Society (or General) Programme. Examples include 'Avian Sight' and 'The Predation of Insects' (with the Invertebrates Section), 'Evolution under the Microscope' (with the Geological section) and 'Plants in Folklore' (with the Botanical Section). Some members continued to work in Avon Wildlife Trust's educational programme at Willsbridge Mill; others set up workshops within the Somerset Invertebrates Group. Instruction was given to graduate trainees of the Somerset Environmental Records Centre and to Nature Reserve Wardens in such diverse topics as 'Wetland Plants, 'Dipterans', 'Ferns' and 'Aquatic Invertebrates'. There is strong emphasis on informing people of important biological principles at field meetings. Four members of Council gave an introductory session to the visually handicapped people at the Bristol branch of the RNIB, illustrating the ability of the Society to offer them friendship and outings, and to show how the special listening skills of the blind could be of value in insect and bird recognition. The Society will do well to promote within its ranks a positive attitude to the cultural and physical handicaps of potential members in the region.

Simon Carpenter, Field Secretary of the Geology Section, has initiated the Rockscape Project, a circular trail of Regionally Important Geological Sites. Society funds support part of this work. Our natural history library, housed in the City Museum, was opened to members of the Society and the public at a special day in October, designed to show off its treasures and familiarise people with borrowing books and journals.

Publications The 1999 Proceedings of the Bristol Naturalists' Society, entitled 'Nature In Avon', was published in November. This Millennium Celebration edition consisting of 115 pages, included a posthumous article, 'Mines and Quarries in the Clifton Area', by Professor R.J.G. Savage. The specifically millennial articles are: 'Entomology in the Twentieth Century', 'Changes in Bird Life in the Twentieth Century' and 'The Study of Ornithology in the Twentieth Century'. One of the important sections is that reporting regional biota, the reports of the Botanical, Invertebrate and Mammal Sections. 'Nature in Avon' is widely exchanged with other Natural History Societies in this country and abroad, and goes to several University libraries.

The Avon Bird Report for 1999 was published in October. Among several original articles is 'The Timing of Summer Migrant Arrival in the Avon Area 1920 – 1998', correlating migrant changes with temperature fluctuations. Also included are descriptions of rare species and special survey reports for the year. Mr Bland and Dr Rose are the BNS representatives on Avon Ornithological Group, which jointly publishes The Avon Bird Report.

The monthly Bulletin under the new editor, David Davies, continued to develop as a means of communication giving news, current programme notes, meetings and survey reports. This publication is important in informing members of interesting finds on Society field trips and of monitoring work. Also included are data from the various specialist groups based at BRERC and elsewhere to which members belong.

A new Web site was set up, giving details of the Society, Sections, Programme and monthly update. It can be accessed on http://www.digitalbristol.org/members/nature/ Amongst grants given by the Society, one was made covering the cost of colour plates and assisting in the publication of the new Flora of the Bristol Region, published in December. Several members have been active in producing this volume, updating J.W. White's Flora of Bristol published in 1912.

Research. The Society maintains close links with the Geology and Biology Sections of the City Museum and with Bristol Environmental Records Centre (BRERC), which the Museum administers. BRERC acts as the main collation point for all environmental records, and the 600 or so members of the Bristol Naturalists' Society are key contributors to the recording schemes that it coordinates. Members of the Society are also active field naturalists within various study groups based at BRERC: these include the Reptile and Amphibians, Moths, Butterflies, Dragonfly Recording, and Hoverfly Groups and the Mollusc Atlas.

Conservation. Geology Section members have continued the work of clearing and interpreting geological exposures along the Bristol-Bath Cycleway. The Section also has a grant from the Royal Society for Nature Conservation to improve public access and to provide interpretation boards in two geologically important quarries in South Gloucestershire. This work has national coverage. The purchase of a group of neutral grassland fields at Burledge Hill, near Folly Farm, Bishop's Sutton by Avon Wildlife Trust was supported by a grant from the Society. The pioneering Bristol Bird Watch scheme was launched by BNS in partnership with Bristol City Council and Avon Wildlife Trust, and has been taken up locally by over 2,000 people. The Society is linked to the Parish Wildlife Wardens Scheme, a networking initiative designed to protect the local environment and involving volunteers across North Somerset. They are conducting a major hedgerow survey, with advice from the Conservation Officer, Dr Dixon.

Promotion and publicity. Three of our meetings were put into the National Science Week in March, organised by the British Association for the Advancement of Science. Several more of our

events have been put into the new Guided Walks Booklet published by the Forest of Avon team. BNS played important roles in the North Somerset Levels and Moors Open Day, Old Sneyd Park Nature Reserve Open Day, CREATE Centre Open Day and the Millennium Snapshot event organised by North Somerset Council. The Society had a stall at Bristol Flower Show and gained several new members. This was supported by the new green Membership leaflet, 10,000 of which have been printed. Other new promotion aids are a car sticker and leaflet dispensers, displayed at many sites throughout the City.

Council is looking to ways to get our message across to the people of the Bristol region and beyond by seeking to present a higher profile in the environmental and wildlife aspects of municipal and countryside administration. This higher profile is being pursued through active membership of Bristol's Local Agenda 21, Farming and Wildlife Advisory Group, Severn Estuary Management Group, Leigh Woods Advisory Group, and in producing comment on ecological and management changes proposed by statutory bodies. Members have been able to supply accurate ornithological data, refuting claims by a quarry company's own environmental consultants with regard to a proposed extension of a conveyor belt into the countryside beyond their Flax Bourton Quarry. The President has been interviewed twice on BBC Radio Bristol, as also has Dr Dixon, with regard to Weston Big Wood, where the latter has carried out a long-term programme of research. Many hundreds of posters have been delivered to libraries and other centres, promoting talks in the Society's calendar and raising the profile of BNS to the people of Bristol.

The Society's Natural History Library is housed in the City Museum and the Society conveys its warm thanks to the Head of Museums for this facility.

SOCIETY MEETINGS

The first talk on 9th February, hosted by the Geological Section, discussed 'Did Dinosaurs Make Flowers?'. Dr P Barrett rejected the widely accepted theory that conifers evolved into flowering plants to escape the low-level browsing of Brontosaurus-like creatures. He showed that dinosaurs could raise their heads to browse at a great height. The second talk on 25th March by Dr W. Stanton discussed the problems of Badger population growth.

The Society held a Millennium Dinner on 5th May to which the Head of Bristol's Leisure Services, Mr Stephen Price was invited. Dr Philip Radford of West Bagborough gave a very evocative programme of bird song with other country sounds included.

On 10th October, the Invertebrates Section hosted a meeting when Dr Stuart Church spoke on 'Avian Sight and Visual Predation of Insects'. This was scientifically and visually a very illuminating meeting. On 1st November the Ornithological Section hosted a talk on the Birds of East Africa by P. Basterfield. There were striking photographs of a large number of species arranged in systematic order. The final Society meeting of the year was given on 9th December by S.M. Taylor on the topic, 'The Natural History of Christmas'. In his wide-ranging talk, the speaker used no visual aids except for his laptop computer and a single hexagonal cake tin with which he sought to make clear the chaotic nature of the production of every different snowflake pattern.

GENERAL FIELD MEETINGS

11th March Miss Sheila Garden. Tintern

The Tintern Trail provided a delightful walk with excellent views and sightings of many woodland and riverside birds, and early spring flowers, and a very unusual fungus, Scarlet Elf Cup (*Sarcoscypha coccinea*).

24th April Miss Mary Morris. Westonbirt

A visit to Westonbirt Arboretum and Silk Wood in very mixed weather with some heavy showers. Interesting features were the Huntingdon Elm, the only large elm left at Westonbirt following the

Dutch Elm Disease, and the 2,000-year-old Small-leaved Lime that has been regularly coppiced. Spring flowers were abundant.

20th May Miss Sheila McCarthy. Ladyhill Wood, Usk.
A delightful spring walk over fields and through woods, where Bluebells were still making a good show, woodland birds heard. A short walk beside the Usk took the party past a large patch of Giant Hogweed.

10th June Miss Sheila Garden. River Severn.
A morning walk by tracks to the River Severn on the Sandhurst Nature reserve near Gloucester. This was followed by an afternoon visit to Wallsworth Hall to view an excellent exhibition of 'Nature in Art'.

29th July Miss Rachel Lee. Frampton Pools and Arlingham.
A walk by the River Severn at Arlingham, and then along the Sharpness Canal and a visit to the southern end of the Frampton Pools.

30th September Don Cullen. Keyhaven to Pennington, Hants.
A very rewarding walk along the sea wall in perfect weather. Many birds were seen, some on migration, including Little Egrets.

28th October Miss Sheila McCarthy. Wentwood Forest.
In spite of very wet and misty weather a lot of interest was found in the wood, many fungi, some invertebrates, a few late flowers, and some woodland birds were heard.

Rachel C. Lee, General Field Secretary

REPORT OF THE BOTANICAL SECTION

Indoor meetings		
24th January	AGM and Presidential Address	Tony Titchen
28th February	Alpine Floras	Keith Allen
27th March	Members Evening	
23rd October	Landscapes and Flowers of the Burren	Tony Titchen
27th November	Cancellation at short notice due to illness	
	Plants of the Dinosaur Era	Tony Titchen
18th December	Members Evening with slides and exhibits	
Outdoor meetings		
15th April	Avon Gorge and Leigh Woods	Tony Titchen
28th May	Blaise Woods	Clare and Mark Kitchen
10th June	Crook Peak	Tony Smith
1st July	Cotswolds	Jon Rees
17th September	Berrow	Margaret Webster

REPORT OF THE GEOLOGICAL SECTION

At the Annual General Meeting, held on 19th January, D. Cope was re-elected as President. Dr E. Cook was re-elected as Hon. Secretary, D.W. Strawford was re-elected as Hon. Treasurer and Mr S.C. Carpenter was re-elected as Hon. Field Secretary. Members re-elected to the Committee were Mrs M.E. Poolman, R. Clark and D.A. Wilson.

19th January Prof. Steve Sparks: *Monserrat's Andesite Volcano.*
In January, Professor Steve Sparks, University of Bristol presented his video on the Monserrat eruption. The video tells the story of the eruption, as well as giving an insight into some of the more important volcanic processes and discusses volcanic hazards and volcano monitoring processes.

9th February. Dr. Paul Barrett: *Did Dinosaurs Make Flowers?*
Paul Barrett, University of Oxford, gave an entertaining and highly informative talk on the evolution of dinosaurs and dinosaur palaeobiology. The presentation was well attended by members of Bristol University Earth Sciences Department and the Bristol Naturalists' Geology Section.

15th March Dr. Richard Twitchett: *Permo-triassic Mass Extinctions.*
Richard Twitchett, Leeds University, talked about the geology and palaeontology of Greenland, providing an opportunity for us to admire the many wonderful slides. He went on to discuss some of the more wide-reaching implications of global extinction events and their role in the history of life on Earth.

8th Nov ember Dr. Nick Chidlaw: *Early Jurassic Rocks of the Cotswolds*
Nick Chidlaw talked about the geological evolution of the Cotswold Hills, focussing on the Early Jurassic. He linked the sedimentary record and the pattern of faulting to produce an enhanced understanding of the local palaeo-environment during the Lower Jurassic.

13th December Members Evening:
The evening began with a quiz with a number of geological prizes, followed by a series of short talks by members including: 'Clay, Bricks and Brick-making around Bristol' by Roger Clark; 'Brittlestars from the Rhaetic of Aust Cliff' by Paul Stevenson; 'A River on the Move' by Eileen Stonebridge; 'Fossil Teeth and Bones, some Recent Discoveries' by Simon Carpenter; 'From Chair to Chisel, the Story of a Fossil Hunter' by Ray Godwin.
The Department of Earth Sciences, University of Bristol, is thanked for allowing the BNS Geology Section to use its facilities for indoor meetings. Members and Speakers are thanked for continuing to support the programme of indoor meetings.

Liz Cook, Secretary

The following excursions and activities were organised in 2000.

19th March	Simon Carpenter and David Cope. Geological site clearance project, former Fry's factory railway siding, Keynsham.
22nd April	Phil Powell. Ardley Quarry near Bicester – Dinosaur trackways (joint meeting with Oxford Geology Group).
27th May	Geologists' Association Reunion/Earth Alert, Brighton with Bath Geological Society.
24th June	The 15 mile Festival, a celebration of the Bristol and Bath Railway Path, including its geology.Organised by Cycle West and Sustrans.
26th July	Eileen Stonebridge and Roger Clark. *Bristol heritage in stone*
17th September.	Andrew Mathieson. *In the footsteps of William Smith*

Field leaders and members are thanked for their support of the field programme during the 2000 period. Bath Geological Society and the Oxford Geology Group are thanked for allowing the Bristol Naturalists' Society, Geology Section to join them on their excursions

Simon Carpenter, Field Secretary

REPORT OF COUNCIL

REPORT OF THE MAMMAL GROUP, 2000

The Mammal Group again had a quiet year in 2000, with no formal indoor or outdoor meetings arranged. Regular contributions continue to be made to the Bristol Naturalists' Society Bulletin. Liaison with the Bristol Regional Environmental Records Centre, the Avon Bat Group, the newly formed North Somerset Otter Group and the Mammal Society continued during the year. Mammal records are summarised in the Bristol Mammal Report in this issue.

David Trump, Secretary, Mammal Group

REPORT OF THE ORNITHOLOGICAL SECTION, 2000

At the 76th Annual General Meeting, held on 21st January Richard Bland was re-elected as President for an additional year. Mary Hill was re-elected as Secretary/Treasurer. Brian Tizard was elected to the committee, where he joined the re-elected members, Paul Farmer, Barry Gray, Mike Haines, Don Cullen, Sheila McCarthy, Harvey Rose, and Alan Kelly.

Members were very active in fieldwork. They were involved in the National BTO Breeding Bird Survey, Common Bird Census, Garden Bird Survey, Heronry Count, Nest Record Card Scheme, National Lapwing and House Martin and Garden Birdwatch surveys and the WWT Wetland surveys of wildfowl and waders. Members also helped with a number of local surveys, recording over-wintering warblers, the local survey of Birds in gardens in winter and the new Bristol Birdwatch, a winter bird count scheme, and the count of Avon's rookeries,

The programme of meetings was very successful, and well attended this year. The following indoor meetings were held:-

21st January.	AGM and John and Sue Prince, on 'New Jersey in spring'
16th.February	Tony Hawkins on Desert birds in Israel and Arizona
8th.March	David Kjaer on the Birds of Lesbos
5th.October	Fred Quinney on Sparrowhawks
1st.November	Peter Basterfield on Birds of E Africa.
1st.December	Peter and Barbara Barham on Penguins.

The following 15 field meetings were planned (14 were held):-

22rd January	Slimbridge,led by the local warden.	
13th February	Dawlish	Richard Bland.
26th March.	Brean Down	Barry Gray
12th April**	Leigh Woods	Richard Bland
29th April	Sand Point	Paul Chadwick
3rd May	Weston Moor	Lyndon Roberts
18th May.	Frome Valley	Richard Bland
28th May.	Blaise	John Tully
14th June.	Eastwood farm	Barry Gray
24th June	Wentwood	Sheila McCarthy
6th July	Marshfield,	Paul Chadwick and Paul Farmer
2nd September.	Slimbridge	Trevor Evans/Dave Paynter
14th October	Sand Point	Paul Farmer
19th November.	Severnside,	Brian Lancastle
28th December.	Chew	Paul Farmer

** This walk was cancelled because of bad weather.

Mary Hill, Secretary

REPORT OF COUNCIL

REPORT OF THE INVERTEBRATE SECTION, 2000

David Rayner and Ray Barnett agreed to be acting President and Secretary respectively of the Section, although formal elections were not held.

The following indoor meetings were held:

17th March. R. Williams, *The fascinating story of oak galls and their many inhabitants.*

13th November D. Gibbs, Miss S. Hallett and R. Barnett, *Hoverflies in the City Museum.*

In March, the talk by Robin Williams was an opportunity to see excellent examples of macro-photography concerning a subject that bridges the gap between entomologists and botanists. Unfortunately the membership did not respond by attending in large numbers, which was disappointing. The meeting in the Museum this year enabled those who attended, not only to see the Museum collections but also to learn about the voluntary work being undertaken by David Gibbs in assisting in the care of the specimens. The three main dipteran collections of Audcent, Payne and Watkins are being amalgamated into new storage cabinets and the opportunity taken to catalogue and to check the identifications.

The following field meetings were held:

22nd May Mrs J. Boyd, Dolebury Warren
17th .July R. Barnett, Kings Wood, Congresbury
8th August A. Smith, Holford, Quantocks

Ray Barnett Secretary

REPORT OF THE PUBLICATIONS COMMITTEE 2000

The members of the Committee for this year were:- Dr T.A. Smith (chair), Dr R. A. Avery (Editor), Mr. R. J. Barnett, Dr K. Crabtree, Mr R. G. Symes, Mr D. P. C. Trump, Mr R. L. Bland. The Committee met five times during the year. The 1998 and 1999 issues of the Proceedings were published during the year, bringing the volumes up to date. This year Council redefined the responsibilities, membership and procedures of the Publications Committee, and these will come into effect in 2001. Membership of this Committee, which now includes the Bulletin Editor and the Website Manager, will be responsible for any occasional publications that the Society may produce.

Terry Smith, Chairman

LIBRARY REPORT FOR 2000

It is heartening to report significant interest in the Library during the year, stimulated particularly by the regular Library News items contributed to the Bulletin by Brian Tizard. A successful 'Open Day' was attended by 10 (23 in 1999) members who were introduced to the Library and archive material. Museum staff also showed the party the City Museum Library. The Society is grateful to all those who participated.

In an effort to improve information about the holdings in the Library, software was tested but proved to be very disappointing, a major issue related to the entering of serials such as journals. Problems with lighting were experienced, but additional sockets were installed for electrical equipment, all of which had been tested prior to usage. Sorting and disposal of surplus stocks remains a problem - working parties try to address this.

Mrs. A. F. Hollowell was re-elected as Honorary Librarian. The Library Committee was chaired for 2000 by Roger Symes and met on 4 occasions. The Society Archivist was, *ex officio*, a member of the Library Committee. Council redefined the responsibilities, membership and procedures of the

Library Committee, and all of these will come into effect in 2001. Members of the Committee continued to staff the Library from 12.30 to 1.30 p.m. on Wednesdays, and from 10.15 a.m. to 12.00 noon on Saturdays.

47 (58 in 1999) members made 344 (314) visits and borrowed 324 (260) items. 8 (8) of these visits were made by new members. 30 (29) journals runs were received by subscription. However, subscriptions to 3 national journals, for which we hold substantial runs, were discontinued during the year since the publishing organisations were demanding subscriptions which were very much in excess of those for individuals, and which were quite beyond the means of our Society. 43 (43) journals were received by exchange and 10 (10) journal runs were received as gifts. In addition three short runs of foreign journals from the early 1900s, originally in the BNS Library, then passed to the Bristol City Library and now no longer required there, were returned to the Society's library by the Bristol Central Library.

32 (29) books were purchased, and 24 (10) books, 30 (24) issues of journals and 14 (2) pamphlets/off-prints and reports, which had been donated, were accepted into the library stock. Special name-plates are added to items given to the collection by members. For these donations we are indebted to :- R.L. Bland, Dr. R. Bradshaw, D. Davies, Ms. G.M. Dycke, Dr. D. Hamilton, Mrs. A.F. Hollowell, N. Lock, Dr. M.H. Martin, P.J.M. Nethercott, M.K. Rosewell, R.G. Symes, S.M. Taylor, A.C. Titchen, S.G. Thomas, D.P.C. Trump, D.A. Wilson, The Biodiversity Secretariat, The Royal Society.

In accordance with the charitable status of the Society, but subject to appropriate security considerations, access to the Library is made available to others, particularly by arrangement with University of Bristol. 6 (5) visits were made by members on the staff of the City Museum, 3 (1) visits by non-member Museum staff.
All members of the Committee are thanked for their contributions during 2000. The Society also thanks Stephen Price, Head of Museum Services, Bristol City Council for the continued use of the Library room and for the assistance given to members during the year by Museum staff, and welcomes the use made of the Library by Museum staff.

Roger Symes, Chairman

THE SOCIETY'S ACCOUNTS FOR 1998 AND 1999

Owing to factors beyond the Treasurer's control, the recent accounts were not ready at the time the Proceedings went to print.

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Although I have tried hard to trace the copyright of all of the pictures and quotations reproduced in this volume, I may not have succeeded. If the owners wish to contact me, I would be pleased to give appropriate acknowledgement. If by any chance the copyright of the work of an artist or author has been infringed, I offer my sincere apologies.
The Editor is most grateful to Philip New and to the staff of Nailsea Public Library, and especially to Sarah Dawson, Librarian at Long Ashton Research Station for help in establishing copyright, and for advice on obtaining permission. I must also recognise the sound advice given by Brian North Lee with regard to the presentation of the artwork. I acknowledge with thanks those who have given me leave to publish work for which they hold the copyright.

Terry Smith, Editor

INSTRUCTIONS FOR AUTHORS

The editor welcomes original papers on the natural history of Avon and surrounding areas for consideration for publication in the Proceedings. Inexperienced authors may obtain advice from members of the Publications Committee. Authors should remember that their readers may not be specialists in the particular subject, and that unnecessarily technical language can be a barrier to understanding.

All papers for consideration should reach the editor by the end of November for publication in the following year. If there is likely to be a problem with this target date the author should contact the editor in advance. All Society Reports and Biota should reach the editor by the end of January in the year of publication.

Manuscripts should be double-spaced with wide margins and printed on one side of the paper only. Authors should retain a copy. The wording should follow the style and format of the Proceedings. An abstract should be supplied, and the text should be organised with appropriate headings and sub-headings. Captions to illustrations should be given separately at the end of the text. Abbreviations should be defined on first use, but these should be avoided in the abstract. In addition, whenever possible, text should be submitted on a disk, either as an ASCII file or as a file produced using a recent word-processor program. Please specify the software and version used. The disk and the final hard copy version of the manuscript should match exactly.

Originals, not copies, of photographs, slides, line drawings, diagrams and maps should be submitted, returnable on request. Drawings and other diagrams should not be more than twice final size and made in monochrome. Photographs may be submitted as prints in colour or monochrome. These will normally be reproduced in monochrome, though consideration will be given to their publication in colour. Graphs, charts and simple diagrams should be produced by computer graphics: advice and help with this are available. Permission to reproduce copyright material is the responsibility of the author.

References should be listed at the end of the text, in alphabetical order of the first author's name, and should take the following form. (with book and journal title in italics and first line hanging).

Book: Author (Date). *Title*. Place of publication: Publisher. - e.g.

Rackham, O. (1986). *The history of the countryside*. London: J.M. Dent.
Clapham, A.R., Tutin, T.G. and Warburg, E.F. (1952) *Flora of the British Isles*. Cambridge at the University Press.

Paper: Author (Date). Title. *Journal Name*, volume (part), page nos. - e.g.

Ross, S.M. and Heathwaite, A. L. (1986). West Sedgemoor: its peat stratigraphy and peat chemistry. *Proceedings of the Bristol Naturalists' Society*, 44, 19-25.

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VOLUME 60 (2000)

CONTENTS

2 Editorial

3 Early History

5 The Return of the Otter to Avon
Alison Washbrook

11 Avon Mammal Report 2000
D.P.C. Trump

29 Phenology 110 Years On
R.L.Bland

32 Captions for colour plates

33 Bristol Botany in 2000
A.J. Willis

47 Tree Gazing Around Bristol; The Top Ten Tree Hybrids
A Titchen

67 Bristol and District Invertebrate Report – 2000
R. Barnett

79 Obituaries, John Boyd and John Weeks

83 Book Reviews - The Flora of the Bristol Region
R.L.Bland : The Frome Valley Walkway *A.G Smith*

88 Council – 2000

89 Report of Council

Inside back cover- Instructions for Authors

Front Cover – Centaurea cyanea (Cornflower) by Andrew Town
See Bristol Botany in 2000 by A.J. Willis